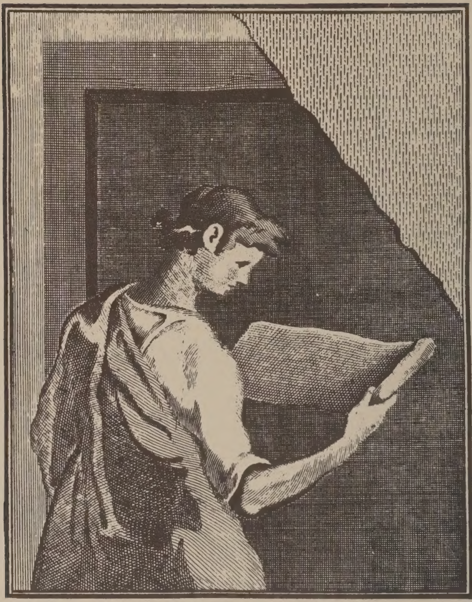


THE GETTY CENTER LIBRARY

PRICE $1.75

The American Annual of Photography

TRADE MARK REGISTERED: 35,385

1926

C. A. WEDDIGEN,
2201 LAWN AVE.,
NORWOOD, CINCINNATI,
OHIO, U. S. A.

General Sales Agents
GEORGE MURPHY, Inc.
57 EAST NINTH STREET, NEW YORK

Think this over

Artistic photographic mountings, the best that we can design and manufacture.

One price for the same quantity, for the same style and quality to everybody, everywhere.

The *latest* improvements in manufacturing—The *latest* styles without exaggerated fads.

We give our personal attention to the smallest detail, and stand behind our goods—

Our line is different, individual and artistic.

GEORGE MURPHY, Inc.
57 EAST NINTH STREET NEW YORK

Everything Photographic

ANSCO PHOTOPRODUCTS, Inc.

BINGHAMTON, N. Y.

Manufacturers of:

Ansco Speedex Film—for all roll-film cameras. The film in the red box with the yellow band.

Ansco Cameras—prices from $1 to $75, with many models making a strong appeal to the expert and discriminating photographer. Ask for catalog.

Noko Paper—for amateur finishing and commercial work. A quality product at attractive prices.

Commercial Cyko—a fast contact paper for commercial photographers and amateurs.

Enlarging Cyko—a projection paper of the highest grade. For enlargements of true professional quality.

Professional Cyko—the standard of uniformity and quality for the best grade of studio work.

Ansco "Contest" Paper—a new fast contact paper for professional portraiture.

Ansco Portrait Film—a cut film of high speed and quality to meet the most exacting studio requirements. Also supplied in amateur sizes, from 2¼x3¼ up.

Professional Equipment—studio outfits, view cameras stands, printing machines, etc.

Ansco Cine Film—for the motion picture industry.

Film and camera dealers everywhere. Paper stock houses at convenient points. Price lists and complete information on request.

ANSCO PHOTOPRODUCTS, Inc.

BINGHAMTON, N. Y.

Agfa

ROLL FILMS

highest sensitiveness, non-curling, orthochromatic. Give brilliant negatives.

FILM PACKS

the "all metal" pack, great stability, perfectly flat position of the films. Photographic qualities identical to Agfa Roll films.

PORTRAIT FILMS

An ideal Agfa Emulsion for portraiture on a heavy celluloid base with gelatine backing.

DRY PLATES

A plate for every purpose. Descriptive catalogue on application.

COLOR PLATES

for pictures in Natural Colors. Landscape, portraiture (including flashlight portraiture) photomicrography and scientific work.

DEVELOPERS

Pure Developers for all Photographic Work: Rodinal, Metol, Ortol, Eikonogen, etc. Agfa Developers are a standard for all others.

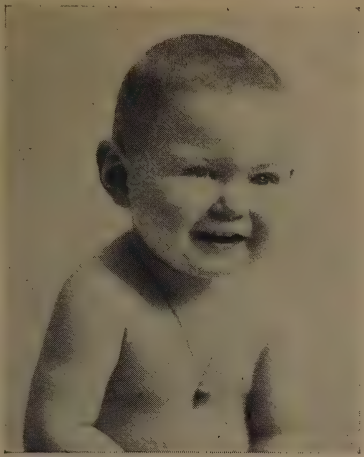
FLASH POWDERS

the flashlight powder producing the most intense light with hardly any smoke.

Dr. ANDRESEN'S "PHOTO HANDBOOK," 300 pages of useful information, profusely illustrated, 50c. postfree. *Complete Agfa Products Catalogue Sent on Request.*

YOUR DEALER CAN SUPPLY AGFA PRODUCTS

Agfa Products, Inc., 114 E. 13th St., New York



MADE WITH B. & L. SIGMAR LENS

Perspective
Brilliancy
Speed

THE SIGMAR LENS

The increasing demand of particular people for large head images has fostered the development of the SIGMAR LENS. Its long focal length makes the image stand out in fine perspective and its speed gives the print an unusual brilliancy. It is everything you have been looking for in a Better Portrait Lens.

The SIGMAR LENS has a speed of f:4—f:4.9 and is made in three focal lengths, 16″, 19″ and 22″, recommended respectively for 8 x 10″, 11 x 14″ and 12 x 15″ negatives. It comes completely equipped with shutter, bulb and hose, large hood and 9 x 9″ or 10 x 10″ front board, ready to mount on your camera.

BAUSCH & LOMB OPTICAL CO.
679 St. Paul St. Rochester, N. Y.

The Photo-Miniature

SERIES OF HANDBOOKS ON PHOTOGRAPHY

Published as a Monthly Magazine at $4.00 per year—12 numbers. 40 cents per copy.

Send for List of Titles

NEW NUMBERS—NOW READY

No. 197: Profitable Photography
No. 196: Photographic Copying Methods
No. 195: The Technique of Portraiture (Illustrated)
No. 194: Photographic Failures & Remedies
No. 193: Projection Printing (Enlarging)
No. 192: What Pictorialism Is (Illustrated)
No. 191: Outdoors With a Hand Camera
No. 190: Stereoscopic Photography
No. 189: Making an Auto-Focus Enlarger (Illustrated)
No. 188: The Exhibition Print (Illustrated)
No. 187: Photographic Lenses—in Use
No. 186: Bromoil Prints & Transfers (Illustrated)
No. 185: Kallitype and Allied Processes
No. 182: Photographic Studios (Illustrated)
No. 181: The Photographer & the Air Brush
No. 174: Home and Garden Portraiture (Illustrated)

New Books and New Editions

The Year's Photography

An Illustrated Review of the R. P. S. Exhibition of 1925; with a few papers of general photographic interest. About 100 pages, with 80 illustrations. Paper covers, 85 cents postpaid.

Tracts for Pictorial Photographers

No. 1: The Real Pictorialism (F. C. Tilney)
No. 2: Oil, Bromoil and Transfer (Tilney & Judge)
No. 3: The Art of Pigmenting (Bertram Cox)
No. 4: Expression in Pigmenting (F. C. Tilney)

32pp. Illustrated; Postpaid 50 cents each

The Photographic Researches of Ferd. Hurter and Vero C. Driffield

A Memorial Volume, edited by W. B. Ferguson and republishing all their original pages, including *The Photo-Miniature:* No. 56, with a Bibliography of Later Work. 374 pages. Illus. Cloth. $9.

The Wet Collodion Process

By Arthur Payne. Including the use of Dry and Color Sensitive Collodion Plates for Process Work, Lantern Slides, Ferro type and Photo-Micrography. Second Edition. 126 pages. Illustrated. $1.50.

Send for New Book List

TENNANT AND WARD, 70 FIFTH AVE., NEW YORK

GOERZ

PHOTOGRAPHIC LENSES of high grade: the old reliable **Dagor, f:6.8,** for hand cameras and commercial work; **wide angle Dagor, f:9,** with plenty of light for focusing (new); **Dogmar, f:4.5-f:5.5,** the ideal speed lens, the single lenses give large size images; **Syntor, f:6.8 and Tenastigmat, f:6.3,** moderate speed, inexpensive hand camera anastigmats; **Portrait Hypar, f:4.5,** the portrait lens without wire edge sharpness; **Kino-Hypar, f:3 and f:3.5,** for movie cameras; **Kino-Telegor, f:6.3,** for telephoto movie effects; **Telegor, f:6.3,** a fast working telephoto lens for reflecting cameras, for sports and naturalist photography; **Artar and Gotar Lenses** for the photo-engraver; **Compound Shutters,** etc.

OUR CAMERA LINE comprises **Roll Film Tenax; Pocket Tenax** for plates and film packs; **Taro** and **Manufoc Tenax,** with double extension for plates and film packs; **Ango Focal plane Cameras; Stereoscopic Cameras; Motion Picture Cameras and Projectors.**

Complete line of accessories, plate-holders, film pack adapters, kits, etc.—carried in stock.

Other products are **Binoculars, Telescopes, Polariscopes, Barometers and Scientific Instruments** of varied types.

Information and Printed Matter on Request

C. P. Goerz American Optical Co.

327 East 34th Street, New York City

The largest selling Quality pencil in the world

VENUS PENCILS

For bringing out the soft tones of a photograph, deepening the shadows and emphasizing the high lights —VENUS Pencils are known the world over as perfect tools.

17 Black Degrees
6B Softest to 9H Hardest
and 3 Copying

Plain Ends, per doz., $1.00
Rubber Ends, per doz., $1.20

VENUS
Artists'
PENCIL No. 849

Delights the soul of a retoucher. No sharpening—always full length, in 16 degrees from 5B to 9H, with a correspondingly marked holder for each degree. Separate refill leads in boxes of 6.

No. 849 Venus Pencil
40c each

No. 842 Refill Leads
$.60 box of 6

At stationers and stores throughout the world.

American Lead Pencil Co.
220 Fifth Ave., Dept. Ph.
New York
and London, Eng.

849 B VENUS Drawing AMERICAN PENCIL CO. New York

AMONG the many useful articles for which man craves possession, there is invariably the product of one particular manufacturer, which dominates all others.

From pipes to motor cars, from chewing gum to pianos—whatever the article may be—there is always one distinctive product, that is recognized as the *best*.

Few commodities dominate their field for general excellence, for outstanding superiority over all others, to such a marked degree, as do the products of *Carl Zeiss, Jena,* creators of the celebrated Tessar lens.

Harold M. Bennett
153 West 23rd Street
New York

Rough & Caldwell Company

Artists and Designers of

PHOTOGRAPHIC BACKGROUNDS

Backgrounds of artistic merit offered and priced according to design. All our grounds are *made on order* and *we submit photographs of designs* for *examination* to be returned when selection is made. Always state style desired.

We are producing:—

Interior Group, Interior, Exterior, Exterior Light Effects, Floral, Cloud, Children's, Sketch, Head and Bust designs, on *Muslin, on* 12 *oz. Duck (Canvas), in Distemper* and *Flatted oil—*

No. 7296—Landscape

No. 7298—Tapestry

Also

"THE PORTAFLEX"

Home Portrait Folding Background

Can be folded small, and stretched with a few thumb tacks. Color is permanent—cannot rub off. Three tones. ***Full Sepia, Umber—Gray and Blue Black*** painted for first class photography.

5 x 6 Tapestry designs	**$20.00**
5 x 6 Landscape designs	**15.00**

Larger sizes any design, 50c per square foot.

Prints sent for examination—to be returned.

Tapestry designs in larger sizes can be used as a drapery.

Rough & Caldwell
Co., Inc.
57 East 9th Street
New York City

Photographers who have been seeking the ideal lens will find the exactness, definition and speed of

TAYLOR-HOBSON
COOKE LENSES

unsurpassed by any lens on the market, today.

A selection of the more famous lenses includes—

SERIES O—OPIC—F: 2

For night pictures and exceptionally difficult subjects—for stage scenes with ordinary stage lighting—and for other abnormally difficult work.

SERIES X—SPEEDIC—F: 2.5

The latest products of Taylor-Hobson, and the first f: 2.5 *lenses to appear on the market. At f:* 2.5, *these lenses are nearly twice as fast as lenses working at f:* 3.5, *and more than three times as fast as lenses working at f:* 4.5.

SERIES II—AVIAR—F: 4.5

Originally designed to meet the demand for an f: 4.5 *anastigmat having speed and definition for Aerial Photography, they have now been adapted for advanced photographic work.*

SERIES VIII—TELIC—F: 5.6

A Telephoto Anastigmat, compact, high-speed lens of long focus, requiring only a short bellows extension. It gives large images of far-distant objects—at twice the distance the image is the same size as with the ordinary lens, and at the same distance it is twice the size.

PORTRAIT LENSES—F: 3.5—F: 4.5—F: 5.6

In the three series offered the photographer has a wide choice of speeds sufficient for all needs of the modern studio. Sharp or diffused images can be obtained with ease and sureness.

Catalog at your dealer's, or direct from

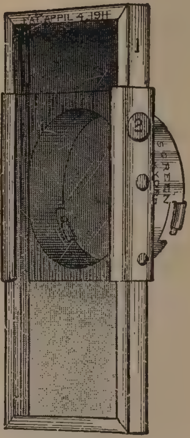
SWEET, WALLACH & CO.
(Eastman Kodak Company)
Sole Distributors for the United States
133 *N. Wabash Avenue* . . . . . . *Chicago*

THE ROYAL FOREGROUND GRADED FILTER

(Patented April 14th, 1911)

The Latest and Greatest Improvement in Ray Filters

STYLE A



STYLE B

The only Ray Screen ever invented that will give an even, equal exposure to both sky and foreground, and produce a perfect cloud effect instantaneously with ordinary plates.

The Royal Foreground Ray Screen is so constructed that the color, which is a strong orange yellow at the top, is gradually diminished until perfect transparency is attained at the bottom. The practical effect of the gradual blending of color is to sift out or absorb the powerful chemical rays from the clouds and sky, which pass through the strongly colored top of the filter, without perceptibly decreasing the weak illumination of the reflected light from the foreground, which comes through the transparent or colorless lower part of the screen in full intensity.

The reason that daylight cloud pictures are rare is that the strength of the illumination from the sky is many, many times that of the partially absorbed and reflected light from objects on the ground.

If a correct exposure is given to the clouds, then the landscape is badly under-exposed; if the correct exposure is given to the landscape, then the clouds are literally burnt up from over-exposure, and no matter how contrasty they may have appeared to the eye, an unscreened photograph shows only a blank white sky.

The Royal Foreground Ray Screen is also very useful for subjects which are more strongly illuminated on one side than on the other, as in photographing by the light of a side window or in a narrow street. By simply turning the dark side of the foreground screen toward the bright side of the object a good, even exposure will result.

STYLE A slips over the front of the lens the same as a lens cap, and may be instantly attached or removed.

No.	Diameter, Inches	Price
0A	⅞	$2.00
1A	1 5-16	2.25
2A	(for box cameras)	2.00
3A	1 7-16	2.25
4A	1½	2.50
5A	1¾	2.75
6A	2	3.00
7A	2¼	3.50
8A	2½	4.00
9A	2¾	4.50
10A	3	4.75
11A	3¼	5.50
12A	3½	6.00
13A	4	7.00
14A	4½	8.00

STYLE B is mounted in a sliding frame so as to bring a filter of any desired depth of color in front of the camera lens.

No.	Diameter, Inches	Price
1B	1 5-16	$4.00
3B	1 7-16	4.00
4B	1½	4.50
5B	1¾	5.50
6B	2	6.00
7B	2¼	6.75
8B	2½	8.00
9B	2¾	8.75
10B	3	9.50

GEORGE MURPHY, Inc.,

57 East Ninth Street **NEW YORK**

Everything Photographic

For Artistic
and Beautiful
Results

"THE KALOSAT"

The Lens
for the Man
Who Cares

THE KALOSAT is not just another lens. It is more than that. It is made of pure transparent crystal quartz.

Quartz, unlike glass, allows the ultra violet spectral colors to permeate through, and register with great speed, producing skin modulations, individuality, and unusual color effects.

REQUEST BOOKLET "L"

It tells how a Kalosat will improve your photography

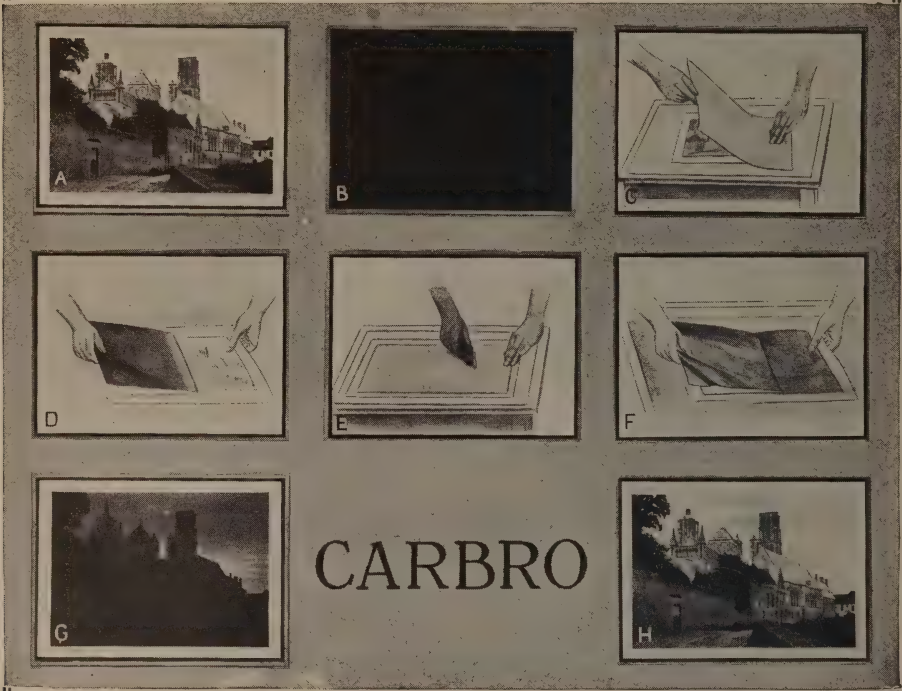
Hanovia Lens Laboratories **Newark, N. J.**

CARBRO

A process by which Permanent Carbon Prints can be made direct from Bromide Prints and Enlargements.

The process is simple—the results are permanent and may be made in practically any of the Autotype Company's 30 colors, including Browns, Reds, Blues, Greens, etc.

NO DARK ROOM REQUIRED



"A" is the Bromide print. "B" is the pigment paper, which after immersion in chemical solutions is laid down on the Bromide print ("C") squeegeed and placed between greaseproof paper for 15 minutes. At the expiration of that time, the Pigment paper is stripped off the Bromide print ("D") and squeegeed into contact with a sheet of Support paper ("E"). The adhering papers are placed between dry blotting paper for about 20 minutes and then immersed in warm water of about 95° Fahr. As soon as the gelatine begins to ooze from the edges, the pigment paper is stripped from the Support paper ("F") leaving a dark mass of pigmented gelatine on the Support paper ("G") in which the photograph is just visible. The print is gently splashed with warm water until development is complete ("H").

The Bromide print should be placed in cold water after operation "D," thoroughly washed and afterwards re-developed with the usual bromide developer to be ready for the next Carbro to be made from it.

"THE CARBRO PROCESS," by A. C. Braham, F.R.P.S. Price $.25.

5 x 7 Trial Outfit, $3.50; 8 x 10 Trial Outfit, $5.00.

Send for detailed price list.

GEORGE MURPHY, Inc., American Agents
57 EAST NINTH STREET **NEW YORK CITY**

Everything Photographic

The Ideal Book on Bromoil

BROMOIL PRINTING and BROMOIL TRANSFER

By DR. EMIL MAYER

President of the Vienna Club of Amateur Photographers
Authorized translation from the seventh German Edition

By FRANK ROY FRAPRIE, S. M., F. R. P. S.
Editor of AMERICAN PHOTOGRAPHY

Bromoil has been rated as one of the most difficult problems to master largely because of the inadequacy of the published information on the process. The earliest writers had not completely mastered the process and did not fully understand the vagaries of the materials. Naturally what they did not completely know, they could not fully impart. Dr. Mayer's book contains the results of exhaustive experiments which have cleared up practically all the difficulties inherent in the bromoil process. It is a masterly piece of exposition and is specially valuable to the amateur who desires to learn this process, because it describes a single plan of work without variation, and gives such explicit directions and such a thorough description of all possible sources of difficulty that an implicit following of its guidance will inevitably lead to success, after which the now experienced bromoil worker will be able to try out variations and invent his own formulas if he so desires.

The book also contains full and explicit directions for all varieties of bromoil transfer, the most beautiful and advanced process which exists for making a photographic print, not only in Dr. Mayer's own account but in the translation of another book on this process alone, by Eugene Guttmann, whose book on "The Making of Bromoil Inks" is also included as a second appendix.

The "British Journal of Photography" says: "It is a matter for unqualified pleasure that such an authoritative handbook should have been made available to English-speaking photographers...... The process of making a bromoil print is treated, step by step, and at each stage such detailed directions and convincing reasons are given as to leave no room for the doubts and misgivings which many books of instruction leave in the minds of their inexperienced readers...... We have nothing but commendation for the volume."

The volume contains 199 pages, size 5½ x 8, bound in red cloth. Price $2.50.

Cash from Your Camera

Edited by

FRANK R. FRAPRIE, S. M., F. R. P. S.
Editor of American Photography

The fullest book on marketing photographs now in print. Full instructions on preparing prints for market, with much information as to the various classes of buyers and the kind of material they want. An authentic and detailed list of the wants of all important picture buyers in the United States at the present time. A verified list of several hundred firms listed elsewhere as buyers of photographs who are no longer in the market. This is a great postage and time saver. Everyone who desires to make a little money from his photography should have this book.

BOUND IN PAPER; PRICE $1.00

Volume XXVIII

PENROSE'S ANNUAL

The Process Year Book and Review of the Graphic Arts, 1926

Edited by William Gamble

A Progressive Record of Art and Technique in Modern Methods of Reproduction, Process Engraving, Printing and Allied Industries. Profusely Illustrated with Fine Examples of New and Interesting Processes, Color Plates, etc. A Treasury of Useful Information, Suggestion and Inspiration. Indispensable to All Workers in the Graphic Arts.

A beautiful example of bookmaking, printed in the highest style of modern typography on special paper, and finely bound in charmingly decorated cloth, with a wealth of illustrations, in monochrome and color, printed by a great variety of typographic, lithographic and intaglio processes, attractively setting forth the skill of the best engraving and printing firms of England.

A limited importation only. Price $4.00 postpaid.

Vol. XXVIII will be ready in January, 1926
Vol. XXVII may be had at $4.00

AMERICAN PHOTOGRAPHIC PUBLISHING COMPANY

428 Newbury Street **Boston 17, Mass.**

Photographic Facts *and* Formulas

We are happy to be able to announce the publication of a volume which has long been desired by photographers, professional, commercial and amateur. This is a compilation of the most essential facts, figures and formulas of photography in compact and convenient shape, that of a single volume which probably extends to about 400 pages. Grouped in logical classifications, beginning with Studio and Dark Room and extending through all the departments of negative making and printing, we have endeavored to collect all the basic facts and methods of photography needed in the processes in use today. Whether you want to label a bottle, to sensitize a plate for green, to find the focal length of your lens, to mix an amidol developer, to make carbon tissue, to mount a print, to translate a metric formula into English weights and measures, to blacken a bare spot on your camera, to do any one of a thousand and one other necessary operations in photography, consult the pages of this volume, and you will probably find there from one to a dozen or more methods. Even now, it is impossible to find space on these pages to give even a skeleton summary of its contents, and some of the items given below include numerous subdivisions and dozens or even scores of formulas and methods. No effort has been spared to cover every formula the photographer is likely to need. To prove this for yourself, glance through the following

BRIEF SUMMARY OF CONTENTS

Studio and Workroom—Backgrounds—Photographing Machinery—Memorial Stones and Brasses—Silverware—Glassware—Coins—Objects under Glass—To Blacken Wood—To Blacken Brass—Fireproofing Fabrics—Flexible Lantern Screen—To Blacken Aluminum—Black for Cameras—Ink for Bottles—Matting Glass—Substitutes for Ground Glass—To Clean Glass—Cements—Diamond Cement—Damp-proof Glue—Marine Glue—Liquid Glue—Silvering Glass—Brashear's Process—The Rochelle Salts Process—The Formaldehyde Process—Line Drawings from Prints—Negatives Direct—Liquid Safelights—Glass Safelights—Green Safelights—Non-Actinic Paper.

Orthochromatic Photography—Wave-Lengths of the Principal Fraunhofer Lines—Distribution of Colours in the Spectrum—Orthochromatizing Plates—Blue-green and Green Sensitizers—Green and Yellow Sensitizers—Panchromatic and Red Sensitizers—Desensitizing Plates—Orthochromatic Filters.

Plate Backing—Caramel Backing—Asphalt Backing—Cornu's Backing—Stained Collodions—Black Backing—Chrevetot's Backing—Quick-Drying Soap Backing—Backing Sheets—Oxgall.

Focus and Optics—To Find the Focal Length of a Lens (13 methods)—Depth of Focus Scale—Focusing Scale—Depth of Focus—Focusing Rules for Hand Cameras—Combining Lenses—Ratio Aperture of Diaphragms—Piper's Table of Angles of View—Correction for Non-Achromatic (Spectacle) Lenses—Telephoto Formulas—Pinhole Exposures—Conjugate Foci.

Exposure—Timing Shutter Speeds—Light Values for Various Latitudes—Speeds and Development Factors of American, English and Continental Plates and Films (American Photography, Burroughs-Wellcome, Watkyns, Wynne and Harvey)—Comparison of Plate Speed Numbers—Speeds of Continental (and some other) Plates and Films in Scheiner Degrees—Speeds of Bromide Papers (Burroughs-Wellcome)—American Photography Exposure Tables—Effect of the Stop Aperture—Variation of F Values—Variation of Enlarging Exposures from Theoretical—The Effect of Altitude on Exposure—Shutter Speeds for Moving Objects—Exposures for Interiors—Night Photography—Stop Aperture Systems—Exposure Meters—Making Paper for Exposure Meters.

Development—Factorial Development (Watkins)—Thermo Development (Watkins)—Stand Development—Combined Developing and Fixing—Deep-Tank Developers for Commercial Finishers.

Developer Formulas—Adurol—Amidol—Diogen—Edinol—Eikonogen—Ferrous Oxalate—Glycin—Hydrochinon—Metol—Metol Poisoning—Metol-Hydrochinon—Ortol—Paramidophenol—Pyrocatechin or Kachin—Pyro-Ammonia—Pyro-Soda—Hurter and Driffield Standard Developer—Pyro-Metol.

Fixing—Plain, Alkaline and Acid Baths—Rapid Ammonia Fixing Bath—Residues—Platinum Residues—Gold Baths—Hypo Eliminators—Hardening Baths—Clearing Baths—Alums as Hardening Agents.

Intensification—Mercury Intensifiers—Chromium Intensifiers—Copper-Silver Intensifiers—Copper-Tin Intensifier—Copper-Ferrocyanide Intensifier—Uranium Intensfier—Lead Intensifier—Quinone Intensifier—Bromo-Iodide of Copper—Dye Intensification.

Reducers—Potassio-Ferric Oxalate (Belitzski)—Hypochlorite and Alum—Bichromate—Permanganate—Iodide and Hypo—Ceric Sulphate—Iodo-Cyanide—Mercury and Cyanide—Cupric Chloride—Hypo and Ferricyanide (Farmer)—Ammonium Persulphate—Quinone Reducer—Harmonizing Harsh Negatives—Mechanical Reduction.

Varnishes—Hot Varnishes—Cold Varnishes—Matt Varnishes—Devarnishing Negatives—Print Varnish—Black Varnish—Alcoholic Cold Varnishes—Celluloid or Zapon Varnish—Crystal Varnishes—Retouching Varnishes—Retouching Medium—Blocking-Out Medium—Fixative for Crayon or Pastel Work.

Stripping—Stripping Films.

Collodio-Chloride—Collodio-Chloride Printing-Out Emulsion—Silver Phosphate Paper—Silver Bromide Printing-Out Paper.

Printing-Out Paper—Gelatino-Chloride or Printing-Out Paper—Formulas for Making, Printing, Toning, Fixing—Platinum Toning—Combined Platinum and Gold Toning—Gold and Uranium—Uranium Toning—Palladium Toning—Red Tones—Developing Printing-Out Paper—Disco (Defender) Printing-Out Paper—Eastman Solio Paper—Combined Bath—Mimosa Aurotype (Self-Toning) Paper.

Plain Paper—Plain or Salted Papers—Matt and Semi-Matt Lac Papers—Sensitizing Leather, Fabrics, etc.

Bromide Paper—Exposure—Development—Amidol—Metol-Hydrochinon—Eastman Bromide Papers—Hammer Opal Plates—Factorial Development for Bromide Paper.

Developing-Out Paper—Exposure—Development—Vitava (Kodak) Paper—Artura (Kodak)—Roylon Developer—Haloid Papers—(Ansco) Papers—Enlarging Cyko—Kodak Velvet Green and Velox Papers—Mimosa Verotype Paper—Eastman Azo Paper—Defender Commercial Paper—Defender Velour Black—Defender Professional Paper—Short-Stop Bath.

Bromide Toning—Copper Toning—Uranium Toning—Iron or Cyanotype Toning—Vanadium Toning—Lead Toning—Uranium and Iron Toning—Cobalt Toning—Gold and Platinum Toning—Selenium Toning—Molybdenum Toning—Toning by Redevelopment.

Sulphide Toning—Direct Processes—Indirect Processes—Toning with Mercury Sulphides—Reducing Sulphide-Toned Prints—Partial Development and Sulphiding.

Carbon—Making Tissue—The Colors—To Coat by Hand Sensitizing—Quick-Drying Sensitizer—Single Transfer Paper—Flexible Temporary Support—Alum Bath—Collodion for Double Transfer from Opal—Opal Glass, Ivory or Wood as Final Support—Substratum for Transparencies—To Intensify Carbon Transparencies.

Gum-Bichromate—Pigments for Gum-Bichromate—Arabin Gum-Bichromate Process—Formula for Pure White.

Iron Printing—Ferroprussiate or Cyanotype Process—Pellet's or Gum-Iron Process—Ferrogallic or Ink Process—Greasy or Printer's Ink Process—True-to-Scale Process—Playertype—Cobalt-Iron Printing—Kallitype.

Platinotype—The Cold Bath Process—Sepia Paper, Cold Bath—The Hot Bath Processes—Platinum in the Developer Process—Print-Out Paper—Sepia Tones by Development—Local Development—Intensifying Platinotypes—Toning Platinotypes—Print-Out Sepia—Restoring Platinotypes—Varnishing Platinum Prints—Platinum Residues—Platino-Uranotype—Mercuro-Uranotype—Palladiotype—Blue Prints by Development—Copper Toning—Satista Paper.

Ozotype, Carbro—Ozotype Process—Ozobrome—Carbro Process.

Bromoil—Oil Printing—Aquarelle Printing—Bromoil Transfer Process—Oilgraph.

Powder—Powder Process—Pepper Dusting-On Process.

Negrography—Negrographic Process—Anthracotype—The Aniline Process—Aniline Black or Endemann's Process.

Feertype—Feertype, Primuline and Diazotype Processes.

Mountants—Dextrine—Dextrine and Gum—Gelatine—Liquid Gelatine—Starch Gelatine—Starch Paste—Dry Mounting.

Stereoscopic Work—Separation of the Lenses—Mounting Prints.

Lantern Slides—Standard Sizes—Spotting—Adhesive for Binding Strips—Lantern Slide Diagrams—Diagram Lantern Slides—Hammer Transparency Plates—Extreme Density Developer—Seed Lantern Black Tone Transparency Plates—Cramer's Hydrochinon-Pyrocatechin Developer.

Enlarging—Table for Enlarging and Reducing—Solar Printing—Casein Paper.

Flashlight—Flashlights—Mixture of Magnesium with Nitrates—Chlorates and Perchlorates—Flash Sheets—Slow Burning Mixtures—Magnesium for Underground Work—Duration of Flash.

Color — Three-Color Filters — Additive Filters—Autochrome Plates—Intensification—Varnishing.

Photomechanical Work—Cleaning—Graining—Sensitizers for Inking Up—Enamels—Bitumen Process—Etching Baths—Collotype—Photogravure.

Weights—Rules for the Conversion of Weights and Measures—Table to Convert Grammes Per Liter to Grains Per 16 Ounces—Percentage Solutions—Comparison of Thermometer Scales.

Chemical Tables—Table for Symbols and Molecular Weights of the More Important Compounds Used in Photography—A Table of Atomic Weights of the Chemical Elements.

The book is a substantial octavo, bound in red cloth, uniform with our other handbooks. The price is $4.00.

Obtainable from all photographic supply stores and booksellers, or from the publishers postpaid on receipt of price.

American Photographic Publishing Company
428 Newbury Street, Boston 17, Mass.

THE AUTOMATIC EXPOSURE-METER

JUSTOPHOT

PATENTEE, Dr. EMIL MAYER

Times exposures automatically with scientific precision, under all conditions of illumination. Exposures from 1/1500 sec. to 2 hours.

THE LIGHT TIMES ITSELF!

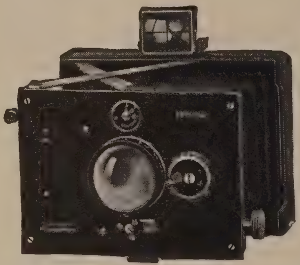
Absolutely correct exposure times, for sun and twilight, studios and dark interiors, mountain scenes and seascapes, in natural and artificial light.

Exposure **tables** require calculation and guesses. Chemical meters using **sensitized paper** fail through color-blindness or spoiled papers. **Darkening wedges** leave it wide open what is to disappear in the shadows—

Therefore Dr. Emil Mayer invented the **Automatic Justophot.**

Price $10.00

Sole Leather Case (for belt or pocket)—$.50



PLAUBEL ANTICOMAR LENSES

ƒ3 up to 7-inch focal length

ƒ4.2 and ƒ4.5 up to 16-inch focal length

PLAUBEL CONVERTIBLE TRIPLE ORTHAR and SATZ ORTHAR, ƒ6.3 and ƒ6.8

Lenses of precision and remarkable covering power and definition. Used by the most critical workers. A lens with all the distortion removed.

PLAUBEL CAMERAS

Every detail has been carefully designed toward a *stronger* construction. The tracks and front boards, as an example, are milled from solid metal instead of being pressed from sheet metal. This makes for rigidity, a most necessary factor if a good picture is to be secured.

RAMSTEIN FILTERS (for cloud photography)

Made of optical glass and ground as carefully as the finest lens.

SPECIALTY REPAIRS We repair every make or kind of camera, shutter or lens. Only the most experienced specialists in their line employed in our repair department. Mail orders receive prompt attention.

Write for descriptive circular No. E57. *Sole U. S. Agents.*

ADAM ARCHINAL CORPORATION

1409 BROADWAY - NEW YORK

ILEX LENSES

Have Stood the Test!

They have proved their merit
and today
take their place as
WORLD LEADERS
making possible
PORTRAITS
of
Individualistic
Distinction

The Ilex Booklet lists in detail a complete line of photographic lenses, suitable for every photographic purpose.

Sent on request.

ILEX OPTICAL COMPANY

ROCHESTER, N. Y., U. S. A.

Pioneers in the successful making and marketing of photographic shutters with the revolutionizing wheel retarder.

FREE THIRTY DAYS TRIAL

Buy Direct from Factory

Save Large Profits of Dealers **Why Pay $125.00?**

Use Leoty's Portable Arc Lamp

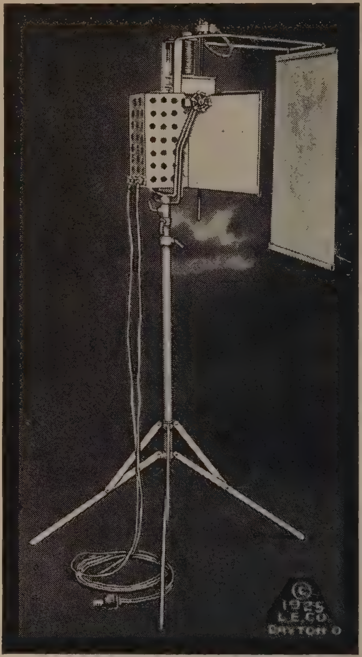
WHY PAY $125.00 FOR A SO-CALLED PORTABLE ARC LAMP WEIGHING 40 POUNDS WHEN YOU CAN BUY THE ORIGINAL ALUMINUM PORTABLE ARC LAMP WEIGHING ONLY 18 POUNDS AND GIVING MORE LIGHT FOR THE AMOUNT OF CURRENT CONSUMED, FOR ONLY $65.00 CASH.

USE LEOTY'S PORTABLE ARC LAMP FOR 30 DAYS AND IF YOU ARE NOT PERFECTLY SATISFIED THE PRICE PAID WILL BE REFUNDED AND THE TRIAL WILL NOT COST YOU ANYTHING, AS WE WILL PAY THE EXPRESS CHARGES BOTH WAYS.

LEOTY'S PORTABLE ARC LAMP IS POWERFUL enough for any work in the **STUDIO.**

SIMPLEST LAMP ever constructed, only two moving parts. No Noise, No Flickering, No Springs, Chains, Levers, Cams, Rods or other mechanism to get out of order and give trouble.

USE LEOTY'S PORTABLE ARC LAMP for any work anywhere, requires no special wiring, works from any ordinary lamp socket, burns for hours without attention (no chain to pull every few minutes), fine for Portraits, Large Groups, Banquets, Commercial Work, Home Portraits, Interiors, Enlarging, Copying, etc. It makes Sun Proofs from your negatives in 30 seconds time.



LEOTY'S PORTABLE ARC LAMP

SPECIFICATIONS

LEOTY'S PORTABLE ARC LAMP is made of strong light weight Aluminum castings, Magnet Coil wound with best grade Asbestos Covered Copper Wire guaranteed against burnouts. Rheostat Tubes wound with highest grade resistance wire. Lamp uses ⅜ by 12 inches National White Flame Carbons Cored, in the top and bottom holders. Aluminum Finished Reflector with folding doors, furnished with new opaque Diffusing Attachment (Patent Pending) that gives beautiful soft roundness in Portraiture and spot light effects without the use of an additional lamp. Adjustable three-piece steel tubing telescopic stand, with folding legs to elevate lamp in the air. Lamp works automatically on either D. C. or A. C. current of 110 volts and consumes from 12½ to 25 amperes of current. (Can be furnished for 220 volts pressure at the same price.) An ample supply of Asbestos Covered Cable is supplied with each Lamp.

CUT YOUR LIGHT BILLS IN HALF

INCANDESCENT LAMPS use a lot of current and lose their actinic brilliancy from use. **LEOTY'S PORTABLE ARC LAMP** using the same amount of current gives five times the amount of Actinic light of any Incandescent Bulb, and never loses its brilliancy. **MAKES THE MODERN INCANDESCENT LAMP LOOK LIKE AN OLD FASHIONED TALLOW CANDLE. TAKES THE PLACE OF DANGEROUS FLASH-LIGHT POWDER.**

PRICE OF LAMP COMPLETE READY FOR USE ONLY $65.00. VULCANIZED FIBRE CARRYING CASE $5.00 EXTRA. Send all orders and make remittances payable to

LEOTE ELECTRIC CO.

Manufacturers of Arc and Spot Light Equipment for Photographers

DAYTON, OHIO

Copyrighted 1925, L. C. L., Dayton, Ohio

Professional Quality Movies

With

Filmo

REGISTERED

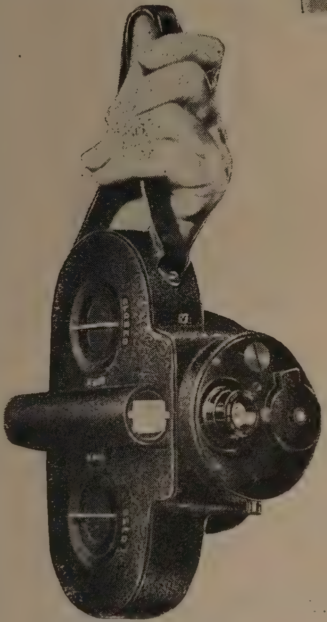
Automatic

World Highest Quality

Motion Picture Camera

For the Individual

Sighted in the Direct Natural Way



Write for Booklet
"What You See, You Get"

Why not motion pictures as well as "stills"? FILMO Automatic Camera is easier to operate than an ordinary Camera. Just hold the FILMO to the eye in the natural sighting position, press a button and "What You See, You Get." No action escapes. Originality of design and quality of workmanship immediately identify FILMO Camera as a superior quality product. Its photographic flexibility, assured by variable speed and interchangeability of photographic lenses, places it in the class with the professional Bell & Howell cameras and equipment used almost exclusively in studios the world over. From a very fast F 1.8 lens up to a 6" Telephoto easily interchanged with the regular F 3.5 Taylor-Hobson Cooke lens—an exclusive feature. Altogether a high grade article, the finest of its kind obtainable.

STANDARD
BELL & HOWELL COMPANY
CINEMACHINERY

ESTABLISHED
1907

BELL & HOWELL CO.

1801 LARCHMONT AVE.
CHICAGO.

BRANCHES
NEW YORK 220 W 42ND ST
HOLLYWOOD 6374 SANTA MONICA BLVD

Manufacturers of 95% of professional cameras and equipment

JOHNSONS
FINSBURY
LONDON

Established { London, 1743
New York, 1916

The Seal on all bottles of the pure and genuine Standard Quality, "SCALES BRAND"

Developing Chemicals

AMIDOL———— JOHNSONS
METOL———— JOHNSONS
PYRO———— JOHNSONS
HYDROKINONE—— JOHNSONS

Made in America

"ACTIVOL" THE SINGLE SOLUTION DEVELOPER FOR ALL PURPOSES

Write us for our "T. and T. T."

(The Activol Time and Temperature Tables.)

THE "SCALES BRAND" SODAS

SULPHITE
CARBONATE } Pure Photographic Anhydrous Powder in 1-lb., 5-lb. and 25-lb. Cans

AT YOUR DEALER

JOHNSON & SONS

Manufacturing Chemists, Ltd., London
and
173 MERCER STREET NEW YORK

List on Application

THE MARSH. Carl H. Sanchez, Jr.

The American Annual of Photography
1926

VOLUME XL

Edited by Percy Y. Howe

C. A. WEDDIGEN,
2201 LAWN AVE.,
NORWOOD, CINCINNATI,
OHIO, U. S. A.

NEW YORK
THE AMERICAN ANNUAL OF PHOTOGRAPHY, INC
MCMXXV

(Trade Mark Registered)

The Huber Art Co.
[illegible]
CINCINNATI

Copyright, 1925, by
THE AMERICAN ANNUAL OF PHOTOGRAPHY, INC.
NEW YORK

FEDERAL PRINTING CO., NEW YORK

THE GETTY CENTER
LIBRARY

PREFACE

THIS is our 40th year of publication, and during that time it has been our privilege to record many remarkable achievements in the photographic field. By means of new apparatus placed on the market during the past year motion picture photography is now within the reach of all, and bids fair to prove a formidable rival to still photography.

As usual, there has been a steady advancement in all the various branches, as evidenced by the interest taken, and by the increased number of photographic exhibits.

In presenting this volume to the public we wish to express our cordial appreciation of the generous manner in which our contributors have cooperated with us in its preparation.

The reader is invited to submit manuscripts or prints for reproduction in our next volume. These should reach us on or before August 1st, 1926. All prints will be returned if requested.

PERCY Y. HOWE, Editor.

422 Park Hill Ave.,
Yonkers, N. Y.

TABLE OF CONTENTS

Contributed Articles

PAGE
Photographic Review for 1925. By C. B. Neblette................*Illustrated* 9
An Emulsion for Producing Photographs Upon Opal, Ivory, Paper and Wood. By A. J. Jarman. 72
Bromoil Transfers In Natural Colors. By Chas. H. Partington............ 80
The Panchromatic Plate In Landscape Photography. By Colin J. Unsworth.. 86
Gelatine Relief and Its Control. By G. L. Rohdenburg.................... 94
Experiences With the Carbro Process. By H. E. Jeltsch.................. 104
Photographic Opportunities Along the Coast. By William S. Davis......... 112
Snapshooters, Beginners, Amateurs and Pictorialists. By A. H. Beardsley.. 118
The Oil Process. By Fred T. Usher.................................... 128
Values. By Paul L. Anderson.. 132
Mounting and Framing As a Fine Art. By A. Lockett..........*Illustrated* 144
The Need for Design In Photography. By Laura Gilpin.................... 154
Alpine Photography. By Louis J. Steele.......................*Illustrated* 158
The Center of Interest—A Study In Composition. By Nicholas Ház. *Illustrated* 180
San Francisco Through the View-Finder. By George Steele Seymour. *Illustrated* 186
Soft Focus Appreciation. By Jos. O. Hickox............................ 192
A Few Practical Points In Portraiture. By T. W. Kilmer.................. 202
Nature Photography. By Arthur H. Farrow.....................*Illustrated* 204
The Printing of Paget Positives. By C. W. Gibbs................*Illustrated* 210
Three Convenient Accessories for the Gum-Bichromate Process. By A. Merrell Powers. *Illustrated* 216
Something to Think About. By Louis F. Bucher......................... 224
Under-exposure. By A. H. Hall.................................*Illustrated* 228
Photographic Holiday Cards. By Dr. Miles J. Breuer............*Illustrated* 234
Notes on Developing. By J. E. Foss.................................... 248
Making Three-Color Filters By Dye Bathing. By Frederic G. Tutton, F.R.P.S. *Illustrated* 250
Far Distant Landscapes. By L. B. Carlson.............................. 258
Fireworks Photography. By William P. Sipes...................*Illustrated* 266
American Annual Formulary.. 273
United States Weights and Measures..................................... 282
English Weights and Measures... 283
Metric System of Weights and Measures.................................. 284
Conversion of Metric Into English Measure.............................. 285
Conversion of Metric Into English Weight............................... 285
Conversion of English Into Metric Measure.............................. 285
Thermo Development... 286
Thermo Development... 287
Table for Making Standard Per Cent Solutions........................... 287
The Elements: Their Names, Symbols and Atomic Weights................. 288
Table of Comparative Plate Speed Numbers................................ 288
Table for Calculating Distances In Enlarging or Reducing.................. 289
Table of Distances for Use In Focusing.................................. 290
Length of Studio.. 290
Uniform System for Stops.. 291
American Photographic Societies... 292

Index to Subjects

PAGE
Acid Fixing Bath................ 275
Activol 273
Adhesive for labels.............. 280
Adurol 273
Alpine Photography 158
Amidol Formula 273

Bichromated Colloid Processes..... 65
Blackening Mixture 280
Bleaching Solution 280
Blue Print Paper 277
Books 10
Bottles, Cleaning 280
Bromide Paper 277
Bromoil 80

Calendar 8
Camera Clubs 224, 292
Carbon Process 278
Carbo Process 104
Cleaning Bottles 280
Cleaning Stains 280
Color Photography 80, 210
Color Sensitizing 28
Comparative Plate Speed Numbers 288
Comparison of F Values.......... 281
Composition 180
Conversion of Metric System...... 285

Deaths 70
Desensitizing 28
Design In Photography........... 154
Developer for Lantern Slides..... 275
Developers..............54, 273, 275
Development 54, 248, 273
Diamidophenol 274

Eikonogen 172
Elements, The 288
Elon 273
Emulsions 22, 72
English Weights 283
Exposure 69

Farmer's Reducer 277
Ferrous Oxalate Formula......... 274
Films to Remove 280
Filters, Three Color............. 250
Firelight Effects 280
Fireworks Photography 266
Fixation 58, 78, 275
Focusing, Table of Distances...... 290
Framing 144

Gelatine Relief 94
Glycin 174
Gold Toning 279
Ground Glass Substitute......... 280
Gum Bichromate Process......216, 278

Hardeners 275
H & D System................... 52
Holiday Cards 234
Hydrochinone Formula 232, 273
Hypo 275
Hypo Test 281

Intensification 60, 276
Iron Printing Processes.......... 65

PAGE
Kallitype 278

Landscape Photography..........
86, 158, 186, 204, 258
Lantern Slides 275
Latent Image 34
Length of Studio................ 290
Lenses 12, 192
Lenses, Cleaning 281

Marine Photography 112
Metol 232, 273
Metric System 284, 285
Monumet Formula 273
Mounting 144

Nature Photography 204
Negatives, Clearing Stained....... 280

Oil Process 128
Over-exposure 249

Paget Positives 210
Panchromatic Plates 86
Paramidophenol Formula 274
Paste 281
Photol 273
Plates 86
Plate Speeds 288
Platinum Paper 279
Portraiture 202
Poison and Antidotes............ 281
Polished Surfaces 281
Printing on Wood............... 76
Printing-out Papers 279
Printing Processes 74
Pyro Formula 174, 249, 273

Reduction 60, 276
Reversal 60
Review of the Year.............. 9
Rodinal Formula 273

Salted Paper 279
Sensitizing 28
Sensitometry 40
Short Stop 276
Silver Printing Processes......... 62
Societies, List of................ 292
Soft Focusing 192
Stains 280
Studio, Length of................ 290

Table of Distances.............. 290
Tank Developing 273
Test for Hypo.................. 281
Thermo Development 286, 287
Toning Processes 74, 279
Transferring 76

Under-exposure 228
U. S. Diaphragms 291
U. S. Weights 282

Values 132
Varnish, Ground Glass........... 281

Washing 58
Weights and Measures.........282-285

Index to Authors

PAGE
Anderson, Paul L. 132
Beardsley, A. H. 118
Breuer, Dr. Miles J. 234
Bucher, Louis F. 224
Carlson, L. B. 258
Davis, William S. 112
Farrow, Arthur H. 204
Foss, J. E. 248
Gibbs, C. W. 210
Gilpin, Laura 154
Hall, A. H. 228
Ház, Nicholas 180
Hickox, Jos. O. 192
Jarman, A. J. 72

PAGE
Jeltsch, H. E. 104
Kilmer, T. W. 202
Lockett, A. 144
Neblette, Carrol B. 9
Partington, Chas. H. 80
Powers, A. Merrell 216
Rohdenburg, G. H. 94
Seymour, George Steele 186
Sipes, William P. 266
Steele, Louis J. 158
Tutton, Frederick G. 250
Usher, Fred T. 128
Unsworth, Colin J. 86

Index to Illustrators

PAGE
Adelstein, Samuel ....(Insert) 32
Akasu, G. S. 83, 181
Alcock, William A. ....(Insert) 72
Allen, John 101, 222
Allison, A. C. G. 61, 259
Andrews, Col. James H. 207
Archer, Chas. K. 11, 21
Aughiltree, J. W. 241
Azhderian, Reuben B. 201
Bailey, Hillary G. 59
Baker, F. C. 35
Baker, Lawrence 149
Barrows, Robert A. 248
Basil, Angus 85
Beam, George L. 231
Berkey, Irving 79
Bedggood, H. 103
Belair, Geo. E. ....47 (Insert) 56
Borrenberger, Em. ....(Insert) 24
Brand, E. G. 197
Broadwell, Wm. H. 209
Breuer, Dr. Miles J. ....
234, 236, 238, 240, 242, 243, 244
Bucher, Louis F. 227
Carlyle, T. C. 199
Carter, Fred William 81
Casper, Edwin F. 133
Cheney, Walter H. 245
Clarke, Cornelia 200
Cole, H. W. 126, 264
Conkling, O. C. 175
Cremer, H. Richardson ....
(Insert Facing Page 9) 179
Davis, William S. 113, 115, 117
Delcroix, Eugene A. ....177 (Insert) 192
Denes, Ronai 237
Distler, Carl C. ....(Insert) 64, 142
Dreher, Edwin Franklin 260
Eickemeyer, Rudolf 145
Eitel, Theodore 223
Ellis, William Shewell .....(Insert) 232
Farrow, Arthur H. 205
Fleckenstein, Louis .....43 (Insert) 160
Flagg, A. C. 211
Frederick, Harold K. ......(Insert) 224
Gibbs, C. W. 212, 214

PAGE
Gilchrist, William 55
Gilpin, Laura 154
Goetz, Louis A. ....(Insert) 96
Hall, A. H. 229
Hanson, Raymond E. 71
Harding, G. H. S. 49
Harting, G. W. ....27 (Insert) 120
Ház, Nicholas ..(Insert) 104, 182, 183
Hellmuth, Chas. A. 23, 221
Hirai, M. 135
Hoch, Ernest 53
Hussey, Henry A. 251
Jarvis, Dorothy ....(Insert) 136, 150
Jeanne, Leon ....(Insert) 256
Johnson, Belle 51
Jones, Myers R. 107
Keighley, Alex., F.R.P.S. 127
Kesslere, G. Maillard .....(Insert) 168
Kilmer, T. W. 203
Kira, Hiromu 239
Koike, Dr. K. 219
Knudsten, Robert A. ....(Insert) 288
Kumazawa, Y. Malony ....(Insert) 248
Kunishige, F. A. ....13 (Insert) 40
Lauffer, Sophie L. 75
Leighton, J. Harold 139
Lomax, J. Arthur, F.R.P.S. 67
Lockett, A. ....
146, 147, 148, 150, 152, 153
MacAskell, W. R. 45
Mori, Junzaburo ....(Insert) 128
Nakayama, I. Laquan 141
Neblette, Carrol B. 30, 32
Neupert, F. C. 157
Nilsen, Dr. Arthur 99
Okamoto, T. ....63 (Insert) 88
Ota, K. 111
Paine, J. Howard 109
Pardoe, Dr. J. B. 210
Petrocelli, Joseph ...(Insert) 152, 173
Phillips, Wm. H. 235
Porterfield, W. H. 15
Powers, A. Merrell 216, 217, 220
Ramage, Josephine 92
Reiter, O. C. 215
Robinson, Benj. W. 93

Index to Illustrators

PAGE
Rohdenburg, G. L.............97, 102
Rutenbeck, A. E..............258, 262
Ryan, Raymond B........(Insert) 184
Sanchez, Jr., Carl H..............
(Insert Facing Page 1) 19
Seelig, G. H..................... 39
Seymour, George Steele...........
186, 187, 189, 191
Shuter, Michael 37
Sipes, William P....266, 268, 269, 272
Smith, Eleanor L................. 255
Spencer, Guy 31, 257
Squier, P. F..................... 119
Steele, Louis J......159, 163, 165, 167
Summons, H. Y................. 267

PAGE
Symes, C. J., F.R.P.S........... 253
Tada, S. 125
Tutton, Frederic G., F.R.P.S.....
254, 256, 257
Taylor, Wilbur E................. 271
Usher, Fred T................... 131
Unsworth, Colin J.............87, 91
Vail Floyd, F.R.P.S...........95, 247
Verburght, Wm. C............... 29
Wallace, Josephine M..........17, 213
Werner, Jr., Louis............... 143
Williams, Jr., Albert..........123, 185
Willard, Stephen H...............263
Wilson, Mildred Ruth..........77, 265
Zerbe, William H................ 195

Index to Advertisers

PAGE
Afga Products, Inc............................ii
American Lead Pencil Co.......................vi
American Photo Products Co. (Paper edition)..........Third cover
Ansco Photoproducts Co.........................i
Archinal Corporation, Adam....................xvi
Bausch & Lomb Optical Co......................iii
Bell & Howell Co..............................xix
Bennett, Harold M.............................vii
Berry & Calhoun...........................xxxviii
Brooks, Burleigh.............................xxvi
Camera Craft Publishing Co..................xxvii
Camera Publishing Co.........................xxix
Central Camera Co..........................xxxviii
Chambers, Frank V..........................xxxvii
Cohen's Exchange, Abe........................xxxv
Cramer & Company, R. W., Inc................xxxiii
Cruver Manufacturing Co.....................xxxvi
Eagle Pencil Co.............................xxvii
Eastman Kodak Company..............Fourth cover; xxi-xxv
Engel Art Corners Mfg. Co.....................xxvi
Faber, A. W....................................xxx
Gelb Company, Jos............................xxxiv
Gevaert Company of America, Inc..............xxix
Gilbert Supply Co.............................xxvi
Goerz, C. P., American Optical Co................v
Goertz, August & Co., Inc....................xxxix
Hammer Dry Plate Co.........................xxxvii
Hanovia Lens Laboratories.......................xi
Higgins & Co., Chas. M........................xxxi
Hopfen & Co., B...............................xliv
Holliston Mills................................xxx
Ilex Optical Co...............................xvii
Japan Paper Co................................xxxv
Johnson & Sons..................................xx
Johnston, J. R..............................xxxiii
Leoty Electric Co............................xviii
Medo Photo Supply Corp.......................xxxii
Motion Picture Apparatus Co....................xli
Murphy, Inc., George..........Second cover; x, xi, xxvii, xxviii, xlii, xliii
New York Institute of Photography...........xxviii
Pelouze Manufacturing Co......................xxvi
Photo-Era Magazine...........................xxxix
Rhodia Chemical Co...........................xxxvi
Roehrig-Bielenberg Co., Inc....................xli
Rough & Caldwell Co.................Third cover; viii
Smith & Sons Co., James H....................xxxii
Sweet, Wallach & Co.............................ix
Tennant & Ward..................................iv
Wallace Chemical Co..........................xxxiv
Willoughby, Charles G. Inc...................xxvii
Wold Air Brush Mfg. Co.......................xxviii
Wollensak Optical Co..........................xxxi

REFERENCE CALENDAR FOR THREE YEARS

1925

	S	M	T	W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S
Jan.	..	..	..	..	1	2	3	**May**	..	..	..	..	..	1	2	**Sept.**	..	..	1	2	3	4	5
	4	5	6	7	8	9	10		3	4	5	6	7	8	9		6	7	8	9	10	11	12
	11	12	13	14	15	16	17		10	11	12	13	14	15	16		13	14	15	16	17	18	19
	18	19	20	21	22	23	24		17	18	19	20	21	22	23		20	21	22	23	24	25	26
	25	26	27	28	29	30	31		24	25	26	27	28	29	30		27	28	29	30	..	..	..
	..	..	..	..	..	..	..		31	..	..	..	..	..	..		..	..	..	..	..	..	..
Feb.	1	2	3	4	5	6	7	**June**	..	1	2	3	4	5	6	**Oct.**	..	..	..	..	1	2	3
	8	9	10	11	12	13	14		7	8	9	10	11	12	13		4	5	6	7	8	9	10
	15	16	17	18	19	20	21		14	15	16	17	18	19	20		11	12	13	14	15	16	17
	22	23	24	25	26	27	28		21	22	23	24	25	26	27		18	19	20	21	22	23	24
	..	..	..	..	..	..	..		28	29	30	..	..	..	..		25	26	27	28	29	30	31
Mar.	1	2	3	4	5	6	7	**July**	..	..	..	1	2	3	4	**Nov.**	1	2	3	4	5	6	7
	8	9	10	11	12	13	14		5	6	7	8	9	10	11		8	9	10	11	12	13	14
	15	16	17	18	19	20	21		12	13	14	15	16	17	18		15	16	17	18	19	20	21
	22	23	24	25	26	27	28		19	20	21	22	23	24	25		22	23	24	25	26	27	28
	29	30	31	..	..	..	..		26	27	28	29	30	31	..		29	30	..	..	..	..	..
April	..	..	..	1	2	3	4	**Aug.**	..	..	..	..	..	..	1	**Dec.**	..	..	1	2	3	4	5
	5	6	7	8	9	10	11		2	3	4	5	6	7	8		6	7	8	9	10	11	12
	12	13	14	15	16	17	18		9	10	11	12	13	14	15		13	14	15	16	17	18	19
	19	20	21	22	23	24	25		16	17	18	19	20	21	22		20	21	22	23	24	25	26
	26	27	28	29	30	..	..		23	24	25	26	27	28	29		27	28	29	30	31	..	..
	..	..	..	..	..	..	..		30	31	..	..	..	..	..		..	..	..	..	..	..	..

1926

	S	M	T	W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S
Jan.	..	..	..	..	..	1	2	**May**	..	..	..	..	..	..	1	**Sept.**	..	..	..	1	2	3	4
	3	4	5	6	7	8	9		2	3	4	5	6	7	8		5	6	7	8	9	10	11
	10	11	12	13	14	15	16		9	10	11	12	13	14	15		12	13	14	15	16	17	18
	17	18	19	20	21	22	23		16	17	18	19	20	21	22		19	20	21	22	23	24	25
	24	25	26	27	28	29	30		23	24	25	26	27	28	29		26	27	28	29	30	..	..
	31	..	..	..	..	..	..		30	31	..	..	..	..	..		..	..	..	..	..	..	..
Feb.	..	1	2	3	4	5	6	**June**	..	..	1	2	3	4	5	**Oct.**	..	..	..	..	..	1	2
	7	8	9	10	11	12	13		6	7	8	9	10	11	12		3	4	5	6	7	8	9
	14	15	16	17	18	19	20		13	14	15	16	17	18	19		10	11	12	13	14	15	16
	21	22	23	24	25	26	27		20	21	22	23	24	25	26		17	18	19	20	21	22	23
	28	..	..	..	..	..	..		27	28	29	30	..	..	..		24	25	26	27	28	29	30
	..	..	..	..	..	..	..		..	..	..	..	..	..	..		31	..	..	..	..	..	..
Mar.	..	1	2	3	4	5	6	**July**	..	..	..	..	1	2	3	**Nov.**	..	1	2	3	4	5	6
	7	8	9	10	11	12	13		4	5	6	7	8	9	10		7	8	9	10	11	12	13
	14	15	16	17	18	19	20		11	12	13	14	15	16	17		14	15	16	17	18	19	20
	21	22	23	24	25	26	27		18	19	20	21	22	23	24		21	22	23	24	25	26	27
	28	29	30	31	..	..	..		25	26	27	28	29	30	31		28	29	30	..	..	..	..
April	..	..	..	..	1	2	3	**Aug.**	1	2	3	4	5	6	7	**Dec.**	..	..	..	1	2	3	4
	4	5	6	7	8	9	10		8	9	10	11	12	13	14		5	6	7	8	9	10	11
	11	12	13	14	15	16	17		15	16	17	18	19	20	21		12	13	14	15	16	17	18
	18	19	20	21	22	23	24		22	23	24	25	26	27	28		19	20	21	22	23	24	25
	25	26	27	28	29	30	..		29	30	31	..	..	..	..		26	27	28	29	30	31	..

1927

	S	M	T	W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S
Jan.	..	..	..	..	..	..	1	**May**	1	2	3	4	5	6	7	**Sept.**	..	..	..	..	1	2	3
	2	3	4	5	6	7	8		8	9	10	11	12	13	14		4	5	6	7	8	9	10
	9	10	11	12	13	14	15		15	16	17	18	19	20	21		11	12	13	14	15	16	17
	16	17	18	19	20	21	22		22	23	24	25	26	27	28		18	19	20	21	22	23	24
	23	24	25	26	27	28	29		29	30	31	..	..	..	..		25	26	27	28	29	30	..
	30	31	..	..	..	..	..		..	..	..	..	..	..	..		..	..	..	..	..	..	..
Feb.	..	..	1	2	3	4	5	**June**	..	..	..	1	2	3	4	**Oct.**	..	..	..	..	..	..	1
	6	7	8	9	10	11	12		5	6	7	8	9	10	11		2	3	4	5	6	7	8
	13	14	15	16	17	18	19		12	13	14	15	16	17	18		9	10	11	12	13	14	15
	20	21	22	23	24	25	26		19	20	21	22	23	24	25		16	17	18	19	20	21	22
	27	28	..	..	..	..	..		26	27	28	29	30	..	..		23	24	25	26	27	28	29
	..	..	..	..	..	..	..		..	..	..	..	..	..	..		30	31	..	..	..	..	..
Mar.	..	..	1	2	3	4	5	**July**	..	..	..	..	..	1	2	**Nov.**	..	..	1	2	3	4	5
	6	7	8	9	10	11	12		3	4	5	6	7	8	9		6	7	8	9	10	11	12
	13	14	15	16	17	18	19		10	11	12	13	14	15	16		13	14	15	16	17	18	19
	20	21	22	23	24	25	26		17	18	19	20	21	22	23		20	21	22	23	24	25	26
	27	28	29	30	31	..	..		24	25	26	27	28	29	30		27	28	29	30	..	..	..
	..	..	..	..	..	..	..		31	..	..	..	..	..	..		..	..	..	..	..	..	..
April	..	..	..	..	..	1	2	**Aug.**	..	1	2	3	4	5	6	**Dec.**	..	..	..	..	1	2	3
	3	4	5	6	7	8	9		7	8	9	10	11	12	13		4	5	6	7	8	9	10
	10	11	12	13	14	15	16		14	15	16	17	18	19	20		11	12	13	14	15	16	17
	17	18	19	20	21	22	23		21	22	23	24	25	26	27		18	19	20	21	22	23	24
	24	25	26	27	28	29	30		28	29	30	31	..	..	..		25	26	27	28	29	30	31

SPIRIT OF THE NIGHT. H. Richardson Cremer.

The American Annual of Photography ·· 1926

PHOTOGRAPHIC REVIEW FOR 1925

By C. B. NEBLETTE

IN preparing this, the fifth of the series of papers on the yearly progress of Photographic Science which it has been the privilege of the writer to prepare for this *Annual,* it has been thought well to alter slightly the general character and scope of this review. When the writer prepared the first of these reviews five years ago, the abstracting of photographic papers was not common and reviews of photographic progress were few. *Photographic Abstracts,* that invaluable publication of the Royal Photographic Society of Great Britain had just been founded and that admirable publication, *Science et Industries Photographiques,* was still only a small supplement to *Revue Francaise de Photographie.* In the few intervening years, however, a great change has taken place. *Photographic Abstracts,* despite considerable financial difficulty, developed considerably in scope, and in thoroughness, until it is now a complete and authoritive publication which enables one to follow the progress which is being made in the many fields of photography with a minimum of time and effort. *Science et Industries Photographiques* has become a separate publication under the expert leadership of L. P. Clerc, and under his direction has become undoubtedly one of the leading journals of scientific photography, reflecting through its pages all that is being done in a photographic way throughout the world. Hence it seems that a collection of abstracts of the most noteworthy papers on the science of photography is unnecessary, since this information can be obtained to better advantage in the abstract journals to which reference has been made.

In preparing the present review, therefore, the writer has altered the plan somewhat, and in this paper an attempt is made to give a general survey of photographic progress throughout the past year rather than simply a collection of abstracts of the more important papers which have appeared. Papers of the latter type have outlived their usefulness, and with the advent of such publications as *Photographic Abstracts* and *Science et Industries Photographiques* have become superfluous and unnecessary. On the other hand, a review of the developments in photographic science, a summary of the progress of the past year may be of some value, and it is these thoughts which have induced the writer to alter the general form and character of this review.

BOOKS AND PUBLICATIONS

Perhaps one of the most valuable publications of the year is the *Historie de la Decouverte Photographie* by Georges Potonniee[1]. In this work the history of photography is covered very completely from its inception to the death of Daguerre in 1851. The second volume will complete the work. Another notable work of the year is the *Physics of the Developed Photographic Image* by F. E. Ross, which is Number 4 of the series of Monographs on the theory of photography from the Research Laboratory of the Eastman Kodak Company[2]. In a work by J. F. Newitt, *Dyestuffs derived from Pyridine, Quinoline, Acridine, and Xanthene* many of the more important sensitizing and desensitizing dyestuffs are covered[3]. The subject of *Aerial Haze and its Effect on Photography from the Air* is covered in Monograph No. 5 from the laboratory of the Eastman Kodak Company[2]. Ilford Ltd. of London have published an English translation of a Manual of Process Work, by L. P. Clerc under the title of the *Ilford Manual of Process Work.* The second edition of *Reproduction Photomechaniques Monochromes,* by L. P. Clerc has been published by Octave Doin, Paris. The New Photographer Ltd. have published a handbook, *Perfection in the Pigment Process,* by Chris J. Symes, in which this well known pictorialist describes in detail the

---

Note—The abbreviations for publications are those adopted by Photographic Abstracts.

[1] *Montel—Paris.*

[2] *D. Van Nostrand—New York.*

[3] *Longmans, Green—New York.*

A LONG SPAN. CHAS. K. ARCHER.

methods employed by him in the production of his bromoil prints.

Two issues of the *Photo-Miniature* series have appeared during the year; No. 195, the *Technique of Portraiture* and No. 196, on *Copying Methods.* In France where there still remains some interest in stereoscopic work, J. Francia has published *Traite Generale de Stereoscopie,* by J. Colardeau. From the office of the same firm has appeared an elementary work on photographic chemistry, *Entretiens Familiers sur la Chemie Photographie,* by Schweitzer. Two amateur handbooks have appeared during the year, *All About Photography,* by P. R. Salmon[4] and the *Amateur Photographer's Handbook,* by Collins[5]. The 38th edition of Dr. E. Vogel's *Taschenbuch,* revised by Karl Weiss, was issued by the Union Dutsche Verlagsgellschaft of Berlin. This is one of the most popular of the elementary works on photography in German, and probably one of the most popular works on the subject in the world, over two hundred and forty-five thousand copies having been sold. The same firm has issued two other works, the one a second edition of Hans Schmidt's work on the Teleobjective, *Das Fernobjective und die Vorsatzlinsen,* and a work on X-ray Photography, *Anleitung zur Rontgenphotographie,* by Knoche. Several works on the use of photography in education have appeared, among which we may mention Motion Pictures in Education, by Ellis and Thornborough[5].

PHOTOGRAPHIC OPTICS AND OBJECTIVES

The activity of the manufacturing opticians for the past year has centered for the most part in the calculation and introduction of objectives with extremely large apertures, and to a lesser degree in the development of the anastigmatic teleobjective.

F. Urban has designed for the C. P. Goerz Optical Company an anastigmatic construction designed to work at F/2 consisting of four spaced lenses, two double convex collecting lenses, one meniscus negative, and one double concave dispersing lens. So far as I know it has not been placed upon the market. H. W. Lee has patented a photographic objective of the Tessar type in which the rear cemented surface is

---

[4] *Ward, Loek Co.—London.*

[5] *T. Y. Crowell—New York.*

THE BROKEN BOWL. F. A. KUNISHIGE.

collective and has its concavity towards the diaphragm[6]. A triplet anastigmat consisting of two exterior collecting lenses and a central dispersing lens thus a similar design to the Triplet of H. D. Taylor, but different from it in that all three lenses are made of glass, having the same properties as have been patented by L. J. R. Host[7]. The sum of the powers of the individual lenses equal O, thus eliminating the stigmatic aberrations. The separation of the lenses are so regulated as to eliminate the chromatic aberrations. C. A. Steinheil and Sohne patented an anastigmat similar in form to the well known Petzval portrait lens, but differing from the latter in that the second positive member is composed of two positive lenses, either cemented or separated in place of the single positive member of the Petzval lens. This construction yields an aperture of F/2.5 with very complete corrections[8].

Carl Zeiss patented a construction for securing an aperture of F/1.9 which consists of two collective members with an interposed negative number followed by a cemented doublet with the dispersive member of meniscus shape and on the exterior. It was probably this construction which was advertised as the Biotar, but was never issued commercially[9].

The Ernemann Werke of Dresden have introduced their Ernostar having an aperture of F/2 and covering a field of forty degrees with critical definition. The lens may be regarded as a development of the Cooke triplet patented by H. D. Taylor in 1895. The front component of Taylor's triplet has been developed into two doublets each containing a double-convex, collecting lens cemented to a dispersing lens. By this construction a greater convergence of the incident rays is secured, while the rays after passing through the central negative lens emerge parallel rather than divergent, as in the earlier triplet construction. This constitutes a new principle in the construction of lenses based on the Cooke triplet and enables the very large aperture of F/2 to be secured without the least sacrifice in the spherical and chromatic corrections which are carried out to such a point that the objectives may be termed a sphero-achromat[10]. H. W. Lee and Kapella, Ltd., have also patented a large aperture objective consisting of a dispersive element placed midway between a front col-

---

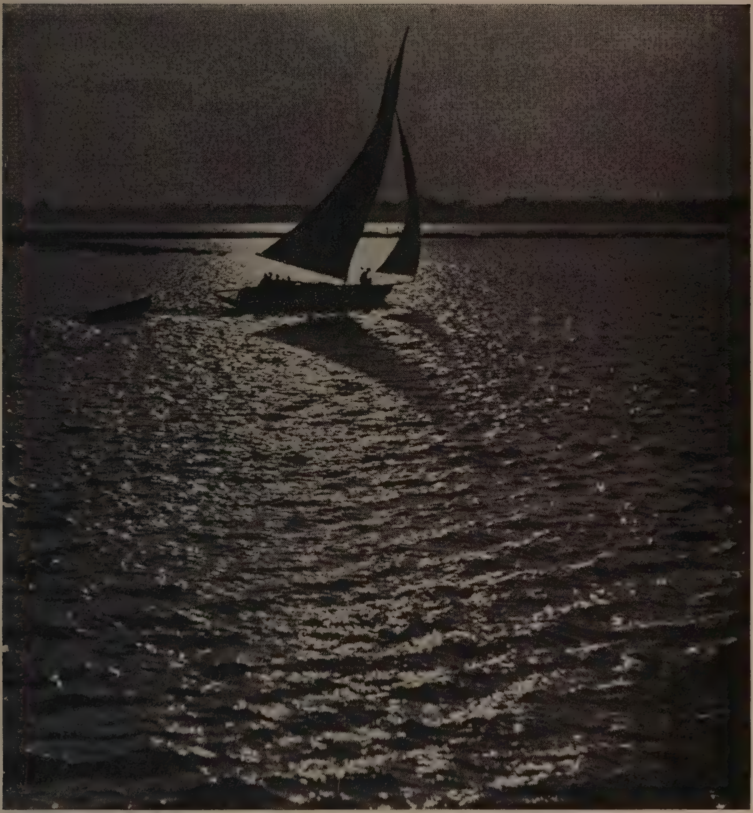
[6] *B. P.* 209371.

[7] *U.S.S.P.* 1485929.

[8] *G. P.* 396823.

[9] *B. P.* 219964.

[10] *Klughardt-Phot. Ind.* 1924, 1008.



THE EVENING SAIL. W. H. PORTERFIELD.

lective member, and a pair of collective lenses placed in the rear and separated by a thin air space. The refractive index of the dispersive lens is considerably higher than that of the collective lens[11].

H. W. Lee has published further data on the calculation and principles involved in the computation of the F/2 objective known as the Opic introduced by Taylor, Taylor and Hobson a year or so ago[12].

Notwithstanding the current interest in the teleobjective few papers and patents have been published during the year for this class of lens. H. W. Lee in a paper in the *Photographic Journal,* 1925, 65, 392, discusses the optical principle upon which the teleobjective is based, and the historical development of the anastigmatic teleobjective with some suggestions as to the future of such lenses. The same worker has also been granted a patent for a non-distorting teleobjective which marks a forward step in objectives of this class. Objectives of this type have possessed more or less distortion which in many cases is not a serious objection, but which for other purposes such as aerial mapping is a matter of the greatest importance, and which has prevented the use of lenses of this type for that purpose, notwithstanding the advantages they possess for such work. The objective referred to consists of two positive, meniscus lenses, either or both of which may be compound, and a rear component composed of two lenses separated by an air space, one lens being positive and the other negative. Both front and rear lenses are separately achromatic[13].

The production of a satisfactory grade of fused quartz on a commercial basis may possibly result in the use of quartz in photographic lenses designed for certain purposes. Already Adam Hilger and J. W. Perry have patented[14] an objective composed entirely of quartz. The combination is corrected for an aperture of F/4.5 and a field of forty degrees. T. Thorne-Baker has patented an objective employing quartz, fluorite or Iceland Spar, all of which are transparent to the ultra-violet for use in spectrum photography in the ultra-violet region[15].

An extreme wide angle objective covering a field of 125-180

---

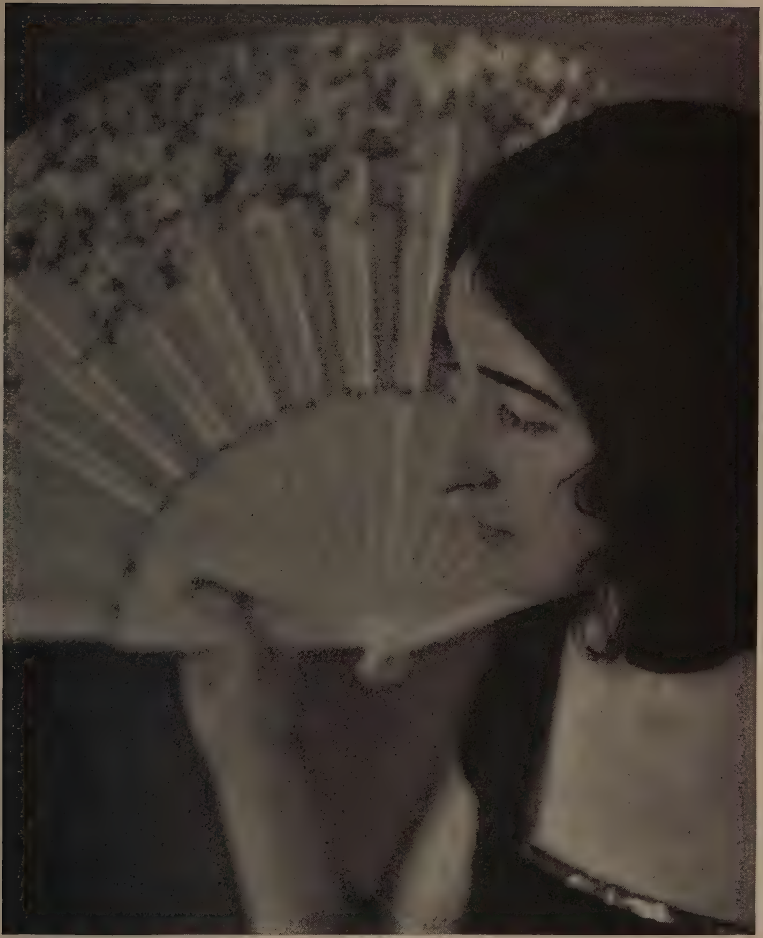
[11] *B. P.* 224, 425.

[12] *Trans. Opt. Soc.* 1923-24, 25, 240.

[13] *B. P.* 222709.

[14] *B. P.* 21299.

[15] *B. P.* 217262.



JOSEPHINE M. WALLACE.

degrees has been patented by R. Hill and R. J. Beck. It consists of a negative, meniscus lens the outer surface of which has the property of converging the principal rays normal to the back surface, next to which there is a positive lens system which produces the image on a photographic plate. The lens is designed more particularly for metrological purposes, but there is little doubt that the principle involved may be usefully employed in the design of lenses for general wide angle work[16].

C. P. Goerz have patented a form of the Dagor construction designed particularly for wide angle work covering a field of 100 degrees and having a working aperture of F/9[17].

F. W. Gehrke has patented an objective of four simple lenses, three being collective with their strongly curved sides turned away from the diaphragm which is second in order, the refractive indices of the two collecting lenses next to the dispersing component are equal and higher than the last collective member[18].

That eminent historian of the photographic objective, Moritz von Rohr, in a paper before the Royal Photographic Society of Great Britain dealt with some of the phases in the history of the photographic objective in England and America between the years 1800 and 1875. In the opinion of Dr. von Rohr, of all of the opticians working at the time of Petzval, an American optician, Wolcott, concerning whom little is known, came nearest to equalling Petzval's mark. Additional information was also given on the efforts of American opticians towards the development in the wide angle lens and on a correcting lens of Piazzi-Smyth of which he obtained with an ordinary Petzval lens an anastigmatically flat field as early as 1875. Details of the correspondence between Monckhoven and Thomas Ross with regard to the introduction by the latter of Steinheit's aplanat in England were also given[19].

An example of a triplet construction of Petzval to which reference was made by Dr. von Rohr in his *Geschichte,* together with the trignometrical calculations and results of a test of an actual example has been found. The lens was well corrected for a field of fourteen degrees at an aperture of

---

[16] *B. P.* 225398.

[17] *B. P.* 209093.

[18] *G. P.* 403-706.

[19] *Phot. J.* 1924, 64, 349.

SUMMER DAY. CARL H. SANCHEZ, JR.

F/2.3, but was not free from coma, and is of little other than historical value. Harting has also found an example of a construction by Zinc-Sommer mentioned by Rohr in his work in the history of the objective, p. 319. It had an aperture of F/6.3 and its corrections were equal to the aplanat. It has been recently developed so as to produce an aperture of F/1.81, and with the aid of the correcting lens of Piazzi-Smyth can be made completely anastigmatic[20].

Considerable interest has been shown in the use of the Twyman Inferometer introduced a few years ago by Amam Hilger for the testing of lens systems. Butkow has discussed the application of this instrument of the third order aberrations[21]. L. C. Martin and R. Kingslake to the measurement of chromatic aberration[22], and J. W. Perry has described methods of using the Inferometer to determine the aberrations of an optical system in the terms in which they are usually expressed, and states that the figures obtained by the Inferometer test are in close agreement by those obtained by computation[23].

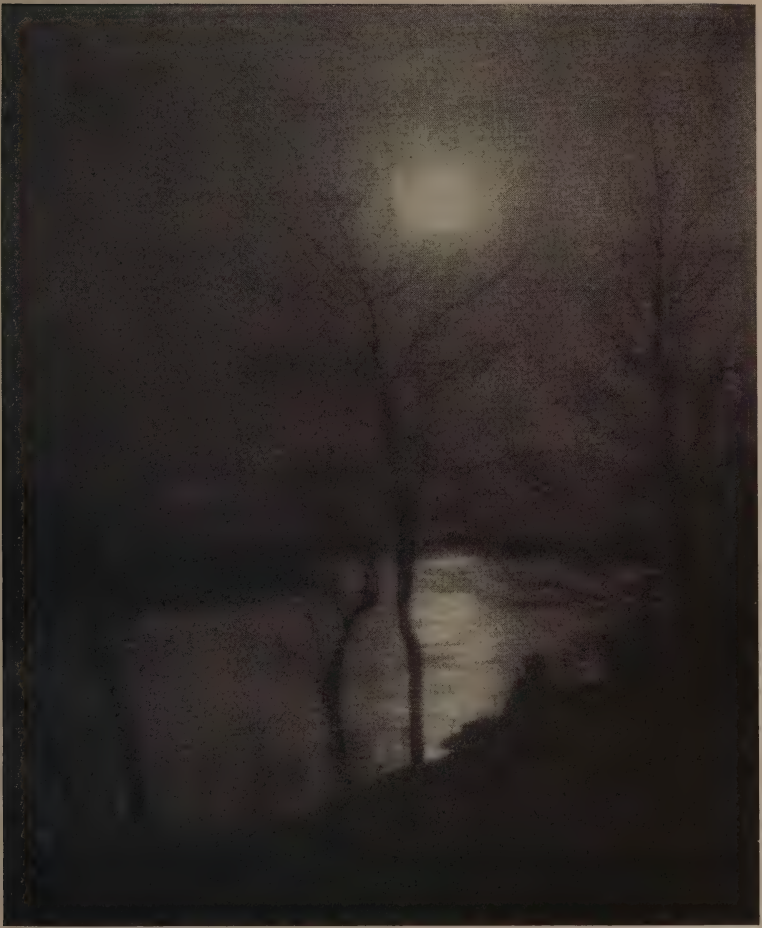
What appears to be an excellent method for the preliminary examination of the performance of objectives is described by Ronchi[24]. It consists in the use of an object composed of a fine network of lenses, the image of which is brought into coincidence with a second similar network, the lack of complete agreement can be observed readily, and the defects of the lens image ascertained.

E. Bratke describes a method of determining the focal length of objects by an interference method. Light is reflected from the front and rear surface of a piece of glass with parallel sides placed at an angle of forty-five degrees to the axis of the lens system onto a plane mirror on the other side of the objective. The light is reflected back from the mirror to the plane, parallel sides of the glass and a series of interference bands is produced from which the focal length of the objective may be determined[25].

Merland has described methods of testing objectives by interference methods based upon those originated by Michelson and Cotton. Merland has applied photographic methods to the counting of the interference fringes so that the curve

---

20. *Phot. Ind.* 1924, 1030.
21. *Z. F. Physik* 1924, 22, 384.
22. *Trans. Opt. Soc.* 1923-25, 25, 213.
23. *Trans. Opt. Soc.* 1923-24, 25, 97.
24. *Riv. Ottic a e Meccan* 1923, 2, 9.
25. *Z. F. Physki* 1924, 21, 190.



THE SILVERY PATH. CHAS. K. ARCHER.

of retardations may be counted from the photographic plate[26].

A. H. Bennett of the Bureau of Standards has published the result of tests of a number of long focus anastigmatic photograph objectives. The majority of the objectives examined were of the Teasar type, at the triplet and four single lens constructions such as the Celor and Dogmar were also examined. The names of the manufacturers, however, are not given; the work is of interest principally from its description of the method employed in testing, and as an indication of the degree of perfection which one may expect in respective objectives of these three classes of construction[27].

EMULSIONS

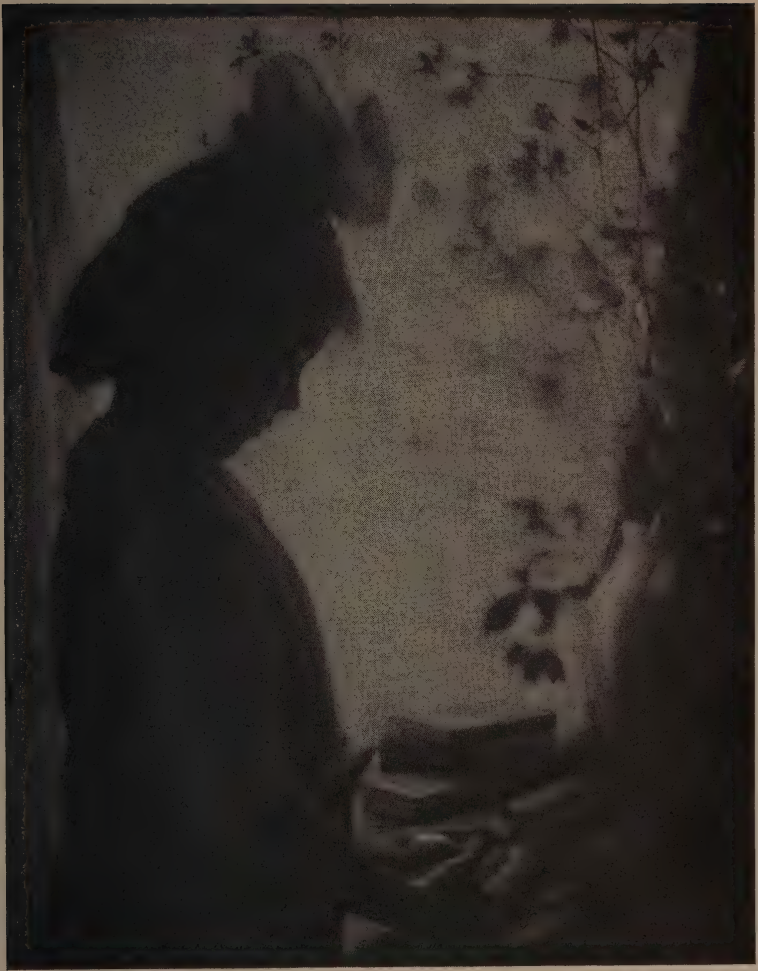
Of the progress which has been made in the preparation of emulsions during the past year nothing is, of course, known beyond the commercial establishments devoted to the manufacturing of emulsions, since all progress in emulsions is closely guarded as a commercial secret. Since about 1885 when emulsion manufacture became largely a commercial enterprise, but little has been published on the manufacture of emulsions, with the result that the investigator of the problems of the photographic plate is left wholly in the dark as to the exact nature of the materials with which he has to work, unless he is working in collaboration with a manufacturer of photographic materials, and this constitutes a severe handicap to the individual worker. It would seem that since there are a number of facts which would be of importance to such workers, were they generally known, and which could be safely divulged by emulsion workers, since they are undoubtedly known to all those engaged in the commercial manufacture of emulsions. Some of those in our larger laboratories, in close touch with the subject might bear this fact in mind and be of considerable assistance to those in our universities and elsewhere who, without thought of commercial advantage, are attempting to carry on independent research dealing with the problems of the photographic plate.

Notwithstanding the close secrecy maintained by emulsion manufacturers with regard to process of manufacture, a number of valuable papers on various phases of the subject have appeared in the course of the past year. There seems to be

---

[26] *Sci. et. Ind. Phot*, 1924, 4, 192.

[27] *B. Stand. Sci. Papars No.* 494.



SILHOUETTE
(Multiple Gum Print)

CHAS. A. HELLMUTH.

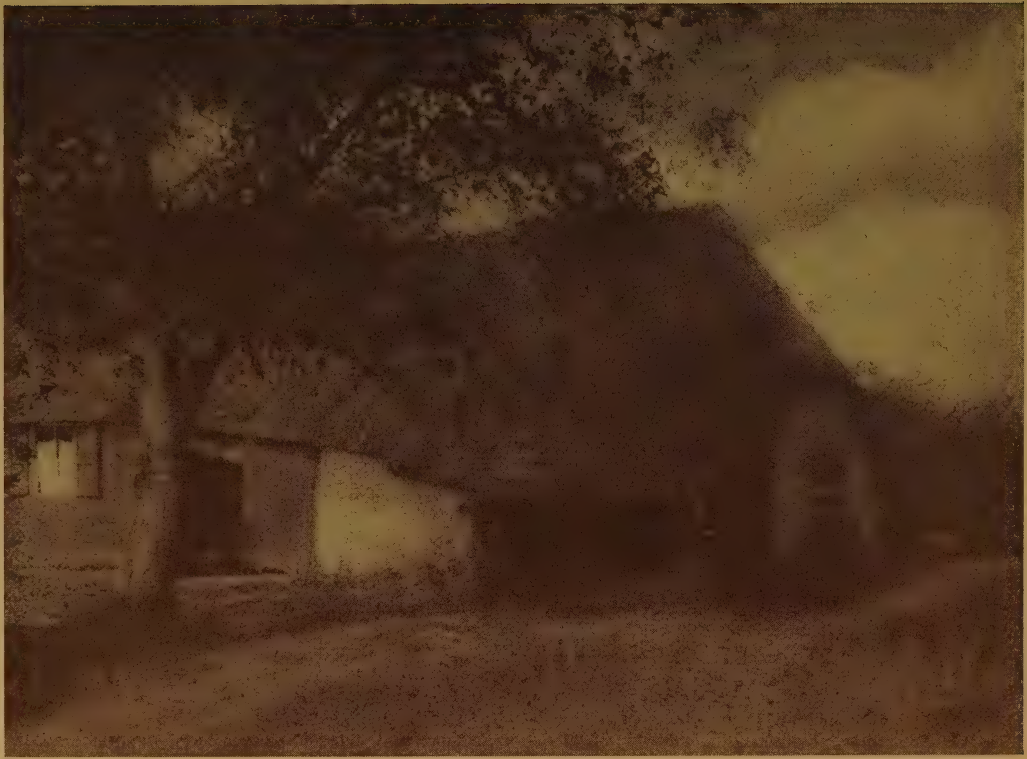
a growing tendency, particularly on the part of the larger manufacturers, to the circulation of reports of investigations on the basic problems of emulsions, and not with the actual details of emulsion manufacture. In this respect the Research Laboratory of the Eastman Kodak Company has been notable, and one of the most important papers published on emulsions in recent years has been that by Dr. S. E. Sheppard dealing with the separation of gelatine-X. From the earliest days of gelatine-bromide emulsion it has been known that gelatines differ in suitability for emulsions and that gelatines of apparently the same properties, and treated under practically the same conditions of precipitation and digestion, would produce emulsions differing considerably in their photographic properties.

The exact nature of this difference in the action of various gelatines long remained an unsolved problem. The subject was taken up in the Eastman Research Laboratory two years ago, and a long series of investigations led to the separation of what is termed gelatine-X, the presence of which in ordinary gelatine is chiefly responsible for photographic sensitiveness, and is the cause of the variation in the effect of different gelatines on the sensitiveness of the emulsion. This substance, gelatine-X, was found to be closely identified with allyl-mustard oil or allyl-sulphide, and upon further investigation it was discovered to be an allylisothiocyanate. This is present in ordinary gelatines in extremely small quantities, not more than one part in a million and reacts with the ammonia used in the digestion of the emulsion and with amines to produce allylthiocarbamide, which is the substance active in producing photographic sensitiveness. It is not, however, the substance composing the sensitivity centers observed by Hodson in 1917, and by Svedberg in 1920, and on the nature of which considerable work has been carried on in recent years. These are the product of further reaction, and are considered by Sheppard to consist of silver sulphide, Ag_2S. The relation of the newly found facts, and the mechanism of exposure, is explained by Sheppard according to his "orientation" theory of the latent image[28].

The conditions effecting emulsion preparation during the

---

[28] *Phot. J.* 1925, 65, 380.



OLD COTTAGE. Em. Borrenberger.
(Bromoil Transfer)

stages of precipitation are considered by Liesegang who shows that the way in which the silver nitrate is added, and the method of stirring, has great effect on the properties of the emulsion. The effect of a small amount of chloride or iodide may be very marked[29].

The digestion or "ripening" of emulsions is the subject of papers by Knoche[30] and by Luppo-Cramer[31]. The paper by Knoche is for the most part a description of some experiments by the author and Lehmann on the "ripening" of washed and unwashed emulsion in egg albumen. Luppo-Cramer deals with the effect of chromic acid on two parts of the same emulsion ripened to different stages. It was found that the reduction of sensitiveness from treatment by chromic acid is greater in the case of highly ripened emulsions than those of lower degree of ripening. It is concluded that the higher original speed of the more ripened emulsion is due entirely to an increase in the number of silver nuclei formed by reduction of the silver bromide by the gelatine. The longer digested portion is more sensitive to direct blackening, and to physical development than the less ripened emulsion, indicating that it contained either more or larger nuclei.

Silver iodide in a bromide emulsion hinders the growth of the crystals, producing a higher degree of sensitiveness than bromide alone and assists in preventing emulsion fog. Luppo-Cramer explains the observations made by Renwick and Sease that the largest and more sensitive grains contain the larger percentage of iodide by the fact that when silver nitrate is not added all at once to the mixture of potassium bromide and iodide the first grains which are formed contain more iodide, and these grow most at the expense of the silver added later. Fogging takes place less readily when the silver is added little by little at intervals rather than all at once, and is less with fine grain emulsions.

Worthy of note in connection with the subject of emulsions are the three Cobb lectures before the Royal Society of Arts delivered by Dr. T. Slater-Price, Director of the British Photographic Research Association. The first lecture is devoted to the subject of gelatine, its physico-chemical properties and the influence of precipitation conditions on the dispersity of the silver halides. The second lecture deals with the drying and swelling of gelatine, and their relation to practical problems of photography, while the third deals with the more recent views of the mechanism of exposure and sensitivity[32].

---

[29] *Phot. Ind.* 1925, 111.

[30] *Phot. Ind.* 1924, 1169.

[31] *Zeit. wiss. Phot.* 1924, 23, 84, 111.

The line of investigation initiated largely as result of the work of Svedberg beginning about 1920 on the mechanism of exposure; the properties and the relation of the individual silver bromide grain to the photographic properties of an emulsion has continued. F. F. Renwick and V. B. Sease describe a method for the analysis of emulsions by sedimentary methods[33]. Centrifugal methods for the separation of colloidal particles have been devised by Svedberg and Rinde[34]. Svedberg and Nichols[35] may eventually find an application in the analysis of photographic emulsion, and the study of the size-distribution of grains in photographic emulsion. In Renwick's method of analysis by sedimentary methods the temperature of the emulsion is lowered very slowly until it sets when a partial separation of grain sizes takes place in the different layers of the emulsion. In all of the emulsions examined it was found that contrary to the view usually held the iodide does not enter into combinations to form a bromo-iodide of silver complex, but is irregularly distributed among the grains and tends to settle out first. This is contrary to the opinion advanced by Carey Lea in 1875 and generally accepted by leading authorities since that time. It would appear that a confirmation of this would be desirable, especially so since it is one which is likely to be of considerable importance in future investigations of emulsions.

Trivelli, Wightman and Sheppard have investigated the relationship between fog and grain-size and find that with the emulsions investigated the percentage of grains which develop fog increases with the size of the grain. The theory is developed that the formation of nuclei of development constituting fog is due to absorption on the sensitive centers of more of the substance of which they are composed, thus making them large enough to give rise to developability without exposure to light. The results obtained also indicate the discrete nature of fog formation[36].

---

[32] *J. Roy. Soc. A.* 1924, 72, 725, 739, 753.

[33] *Phot. J.* 1924, 64, 360.

[34] *J. Amer. Chem. Soc.* 1923, 45, 943.

[35] *Ibid.* 1923, 45, 2910.

[36] *Phot. J.* 1925, 65, 134.

THE SIGNAL TOWER. G. W. HARTING.

The same investigators in the 6th paper of the series on the *Size-Frequency Distribution of Grains of Silver Halide in Photographic Emulsions and Its Relation to Sensitometric Characteristics,* consider the densities derived from size-frequency data. A method of determining the density from size-frequency data was worked out, but the values obtained by computation and those obtained by means of a thalofide cell densitometer did not agree very well[37].

F. E. E. Germann and M. C. Hylan are still of the opinion that small grained emulsions should be faster than those of larger grains, the higher speed of the latter as found in practice they consider to be due to the presence of absorbed soluble halide[38]. In the opinion of S. O. Rawling such a plan is hardly tenable, for while the behavior of silver emulsion grains is undoubtedly largely affected by absorbed substances, it is the absortion per unit of surface and not the absorption per unit of specific surface which is the determining factor[39].

Titration methods for determining the silver in emulsions have been described by M. Marasco[40]. Other methods have been described by Eggert and Medinger[41].

K. Kieser gives a formula with directions for preparing a slow emulsion similar to ordinary gaslight paper for which purpose it is more particularly designed. An interesting paper for those desiring to experiment in the manufacture of emulsions[42].

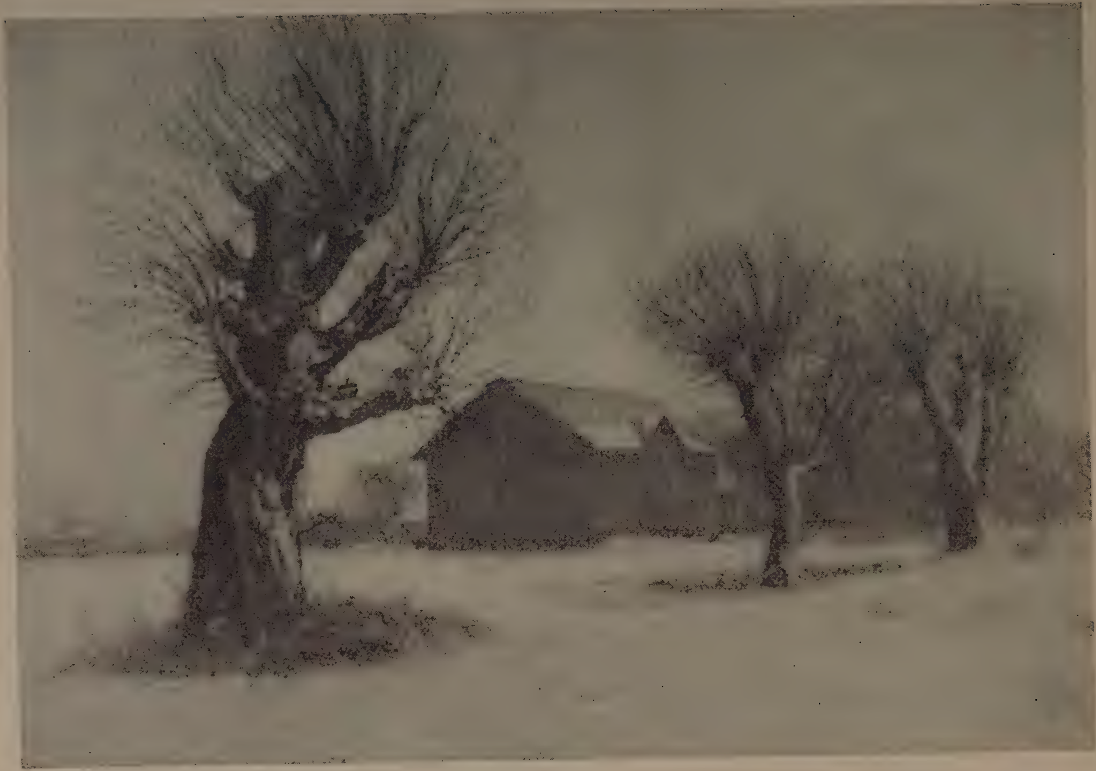
COLOR SENSITIZING AND DESENSITIZING

No great progress can be recorded for the past year in the color sensitizing of gelatine emulsions. The cyanine dyes continue to be investigated at Cambridge by Mills, Braunholtz and Miss F. M. Hamer, and while much of theoretical importance such as the close relationship which exists between sensitizing and desensitizing dyes and the nature thereof, no important color sensitizers have been introduced during the year.

The Fabw. Vorm Meister, Lucius und Bruning and F. Koing have patented[43] the use of dyestuffs obtained by the use of salts of pyridine-ammonium basis with dialkylamino-benzaldehyde or its derivatives. The dyestuffs are especially noted for the strong band in the green regions.

---

37. *J. Phys. Chem.* 1924, 28, 529.
38. *J. Phys. Chem.* 1924, 28, 449.
39. *Brit. J. Phot.* 1924, 71, 401.
40. *J. Ind. Eng. Chem.* 1924, 16, 945.
41. *Phot. Ind.* 1924, 647, *and Zeit. wiss. Phot.* 1923, 22, 209.
42. *Phot. Ind.* 1925, 186.
43. *G. P.* 39566.



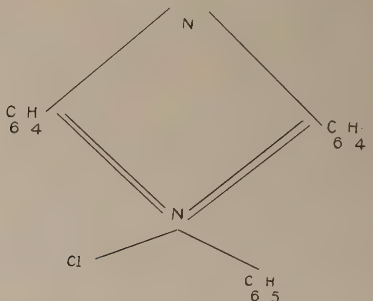
WINTER.
(Bromide)

WM. C. VERBURGHT.

The work of the last two years has shown quite evidently that there is a close connection between sensitizing and desensitizing. For instance, the compounds p-dimethylaminobenzylidenequinaldine-ethiodide and p-dimethylaminobenzylidene-B-napthaquinaldine ethiodide are photographic sensitizers, but if the CH linking in these substances is replaced by an N link, then these substances possess desensitizing properties. The first being even more effective than the safranine. The fact that changing the CH link to N converts sensitizing dyes into desensitizing dyes has been shown not only by F. M. Hamer[44], but also by Mills and Smith[45].

Smith alone has also shown that cyanine dyes which act as sensitizers are converted into desensitizers in the presence of soluble bromides (Ibid). It thus appears that in desensitizing the bromide is the active oxidizing agent, the dyes merely facilitating its action. Further confirmation of this subject has been obtained by Dr. Luppo-Cramer[46], who has shown that if a developable plate is immersed in certain dyes and developing solutions, the latent image is made very sensitive to the action of potassium bromide and other oxidizing agents. On the basis of these observations Dr. Luppo-Cramer has been forced to abandon his oxidation theory of desensitization, regardless of the fact that all active desensitizers are weak oxidizing substances.

Lumiere and Seyewetz have continued their work on the composition of desensitizing substances[47]. In their latest paper[48] they show that the phenazine group



---

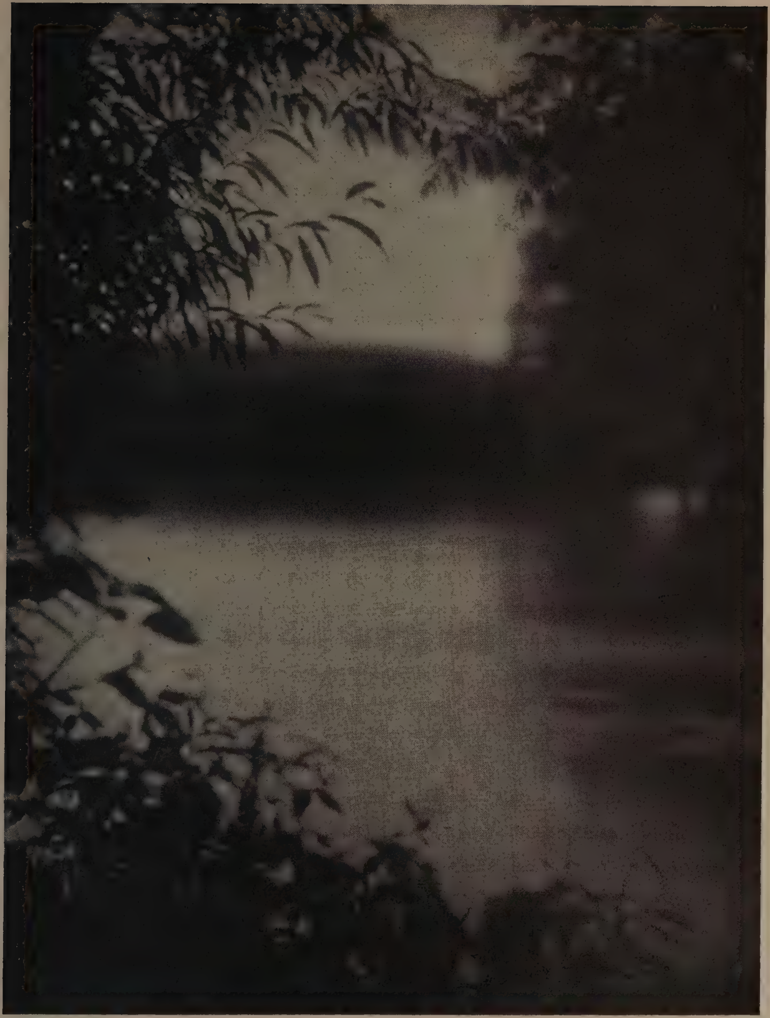
[44] *J. Chem. Soc.* 1924, 125, 1348.

[45] *J. Chem. Soc.* 1922, 121, 2724 *and* 1923, 123, 2288.

[46] *Der. Phot.* 1923, 63, 61, *Phot. Ind.* 1923, 236 *and Ibid,* 1923, 187 *and* 392; *Trans. Faraday Soc.* 1923, 19, 389.

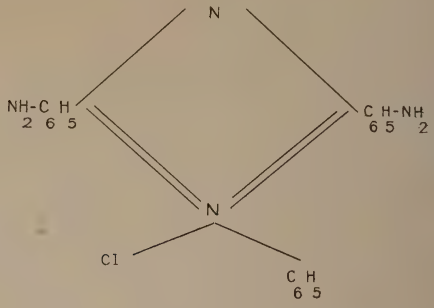
[47] *Brit. J. Phot.* 1921, 68, 351, 370.

[48] *Brit. J. Phot.* 1925, 72, 446.

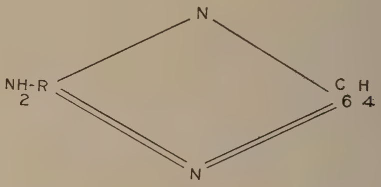


THE POOL. GUY SPENCER.

has no desensitizing properties, nor have the indamines, the intermediate products in their preparation. The desensitizing property appears only in amino substitution products of Phenazine. Phenosafranine



contains two amino Auxochrome groups, first, second or third. If one of these is removed the desensitizing action is reduced. The introduction of Hydroxyl group for an amino group leads to the same result. Replacement of benzene by naphthalene, however, does not lessen the desensitizing powers of the substance. The pinakryptols and Basic Scarlet N are also members of the axine class as are rhyonduline Violet and the oxidized products of diamidophenol, which has been shown by Druce to belong to the amines[49]. The group



in which R is the residue of an aromatic hydrocarbon (benzene naphthalene of phenanthranine) is the group which is characteristic of desensitizing substances.

F. E. Ross records that on treatment with copper sulphate emulsions are reduced in sensitiveness. Washing, however, reduces considerably the effect of the copper-sulphate. The short bathing period increases gamma, but on prolonged bathing without washing there is a reduction in gamma. There is an increase in revolving power with a short period of bathing, and there is also a decrease in fog. The grains appear to

---

[49] *Phot. Journ.* 1925, 65, 140.

IN THE SILENT POOL. Samuel Adelstein.

have lost only their hyper-sensitiveness, the residual sensitiveness of silver bromide remaining. Chromic acid gives great desensitization if not washed out of the emulsion, but alters the characteristic curve considerably and tends to destroy the latent image[50].

Considerable progress can be recorded on the introduction of new desensitizing agents. A new Pinakrypto, Pinakryptol Yellow, has been introduced by Farbw. Vorm. Meister, Lucius und Brunung. This is superior to either Pinakryptol or Pinakryptol Green in that the residual color sensitiveness of panchromatic plates is completely destroyed, while with the former from five to fifty per cent of the original sensitiveness remain after immersion in the desensitizer. The new Pinakryptol is, therefore, particularly useful for panchromatic plates of extreme color sensitiveness. However, as it is partially destroyed by the sulphites it cannot be employed in the developing solution. It is necessary to first immerse the plates in 1 :1500 solution Pinakryptol Yellow and then develop in a developing solution containing five cc of 1 :1000 Pinakryptol Green to each 100 cc of developing solution[51].

The Research Laboratory of Pathe Cinema have reported a new desensitizing substance in Basic Scarlet N when used at a concentration of 1 :10,000. The desensitized plates show a weak region of residual sensitiveness from 3,000 to 5,100 with a maximum at 4,600 which is identical with phenosafranine at the same concentration. The weak reddish brown color is much more readily removed from the film than that of safranine. The dye does not tend to produce fog so readily as Pinakryptol. Methylene blue, Malachite green, Victoria blue, Induline Flavinduline, Rhoduline all act as desensitizers, but produce strong fog which, however, may be prevented by the addition of Acridine yellow, Auramime, Benzoflavine or Acridine orange. The following "couples" are recommended:

1.	Acridine yellow	0.91	gram
	Rhoduline Violet (Bayer)	0.06	gram
	Water	1000	ccs
2.	Methylene blue	0.005	gram
	Acridine yellow	0.02	gram
	Water	1000	ccs

---

[50] *Brit. J. Phot.* 1925, 72, 5, 19.

[51] *Phot. Rund.* 1924, 61, 143.

No. 2 gives no stain and No. 1 practically none[52].

According to Hybl, methylene blue and acridine yellow do not form an effective desensitizer since fogging may be produced on prolonged development, and he concludes that the combination is inferior to phenosafranine or the Pinakryptols[53]. Dr. Luppo-Cramer finds the desensitizing action of methylene blue and acridine yellow as recommended by Pathe Cinema to be considerably less than Phenosafranine or the Pinakryptols, owing probably to the action of the developer on methylene blue. The fogging is always greater than that produced with phenosafranine[54].

Farbw. Vorm Meister, Lucius und Brunung and R. Schuloff patented as desensitizers dyestuffs produced by the condensation of salts of methylpyridine ammonium bases or quinaldine ammonium bases with aldehydes which do not show a marked basic character. For example, the condensation of p-ethoxyquinaldine ethyl iodide with benzaldehyde, dimethylaminonitrobenzaldehyde or chloroacetal. This patent presumably refers to the Pinakryptols already introduced commercially by this firm[55].

THE LATENT IMAGE

The most important papers on the latent image for the student are those on the history of the latent image published by Dr. Luppo-Cramer in *Zeit. wiss. Phot.* 1924, 23, 91. In this the history of the various theories, the supporting evidence and the objections to each of the principal theories is critically reviewed by an authority who has contributed not a little to this line of investigation. The various theories are considered, not only in their historical aspect, but also in the light of latter day research which makes the paper doubly important for the student of photographic science.

Steigmann suggests that the cause of sensitivity of crystals of silver halide in emulsions is due to the disorientation of the atoms, which is likely to be greater for highly disperse crystals than for the less disperse ones. It is probable that the entire energy absorbed as a result of an exposure acts on the places of greatest disorientation where there is naturally the weakest combination[56].

The observations of Bragg on the properties and structure

---

[52] *Rev. Franc. Phot.* 1924, 5, 286 & *Brit. J. Phot.* 1924, 71, 699.

[53] *Phot. Ind.* 1925, 14.

[54] *Phot. Ind.* 1925, 187.

[55] *G. P.* 396402.

[56] *Chem. Ztg.* 1924, 48, 234.

STACKS IN WINTER. F. C. BAKER.

of mixed crystals have been applied to the theory of the latent image by P. E. Henry[57]. Somewhat similar theories have long been held by Sheppard.

The decomposition of silver halides has been investigated by Hartung and by Schwarz and Gross. The investigations of Hartung are a continuation of his earlier studies on the decomposition of silver bromide with the aid of the microbalance. He finds that in the presence of a bromine absorbant as much as 95 per cent of the bromine may be expelled. The most important result of his investigation, however, has been the fact that no evidence has been found for the formation of a sub-bromide. It has long been known that on prolonged exposure to light decomposition of silver bromide takes place with the evolution of bromine, but it is doubtful if such studies as these have any direct bearing on the problem of the latent photographic image[58]. Schwarz and Gross have also found a weighable liberation of halogen on exposure[59].

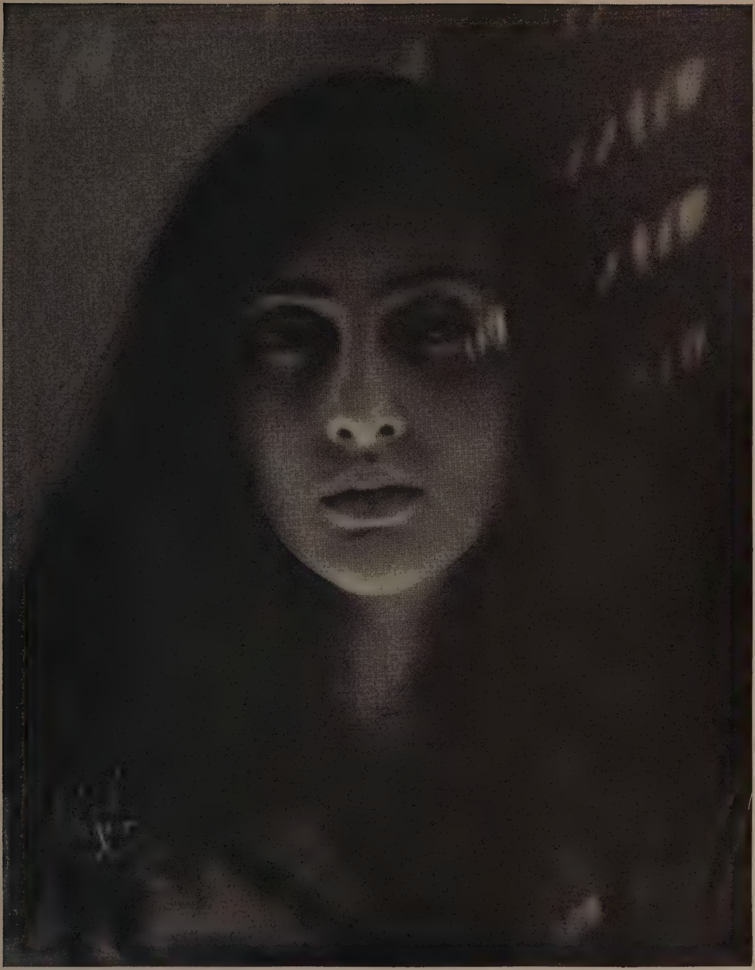
The latent image after fixing has been investigated by A. & L. Lumiere and Seyewetz. Prolonged development in p-phenylene diamine and silver sulphite shows clearly the hexagonal form of the nuclei, but these have no selective action for metallic silver in a solution producing nascent silver, but without a developing substance. It is apparent, therefore, that since an image cannot be developed in the presence of a solution which is capable of producing nascent silver alone, but without a developing agent this latter must in some way enable the nuclei to acquire a selective attraction for nascent silver[60].

The same authors also discuss the destruction of the latent image in fixing. Tables are given to show the time of the immersion necessary to destroy the image with various concentrations of hypo. Prolonged washing after fixing also destroys the latent image. The addition of small quantities of ammonia to the fixing bath lessens considerably its attack on the latent image[61].

Sheppard, Wightman and Trivelli have continued their investigations on the action of oxidizers on the latent image. They confirm an earlier statement that copper sulphate lowers

---

[57] *S. L. P.* 1915, 5.
[58] *J. Chem. Soc.* 1924, 125, 2198.
[59] *Z. Anorg. Chem.* 1923, 129, 41.
[60] *Compt. rend.* 1924, 179, 14.
[61] *S. I. P.* 1924, 4, 139.



STUDY. MICHAEL SHUTER.

the speed, but not the gamma infinity of an emulsion. In the case of single layer plates, there is an increase in gamma infinity. Chromic acid also lowers sensitiveness, and with increased time of the immersion destroys the latent image. Potassium permanganate is even more active than chromic acid[62].

Clark in a comprehensive paper on the action of arsenite on the photographic plate in which he reviews much of the earlier work on the subject and the state of present thought along these lines, is disposed not to accept the statements of Sheppard, Wightman and Trivelli that monosodium arsenite reacts with silver bromide[63]. The latter investigators are of the opinion that the results of Clark's do not support his views on the existence of sensitive centers on the grains prior to exposure. In their opinion the action of arsenite may be explained by its dissolving silver bromide, and producing silver which is absorbed by the sensitive nuclei. They state that arsenite tends to coagulate rather than to peptize silver as is claimed by Clark.

Clark while admitting that some forms of arsenite may react with silver bromide, contends that there is no reaction with a mono-sodium compound and criticizes the results of Sheppard, Wightman and Trivelli, because their investigations were conducted in the absence of gelatine. Experiments conducted on collodial sols in gelatine show that arsenite increases dispersity which would favor the peptization theory. Examples are given of the parallelism between the light sensitiveness and development density produced by arsenite treatment on emulsions of the same composition and grain-size distribution. The general parallelism of the action of light and of arsenite is reaffirmed[64].

Luppo-Cramer objects to the conclusions reached by Clark as a result of the latter's work with arsenite. He concludes that there is little evidence to support the theory that the action of arsenite and light is of the same character, and furthermore that there is no valid reason for believing that the reduction centers of the silver bromide grains consist of other than silver.

Clark considers that in the hydrogen peroxide and arsenite

---

[62] *J. Frank. Inst.* 1924, 198, 507.

[63] *J. Frank Inst.* 1924, 198, 629.

[64] *Brit. J. Phot.* 1925, 72, 155.

SOLITUDE.

C. H. SEELIG.

on the plate, two processes are at work simultaneously. At first the tendency is to produce development nuclei. At the same time the solution exerts a peptizing influence on these nuclei, and if the latent image is weak, the peptizing action will predominate and nucleus formation will cease. Reversal will then occur, owing to the destruction of the development nuclei. Experiments show that both hydrogen peroxide and arsenite will destroy the latent image left after fixation. The action of light in producing reversal is not similar to that of arsenite in producing a similar action[65].

SENSITOMETRY

As a result of the 6th International Congress of Photography held during the summer at Paris, considerable interest has been shown during the past year in sensitometry, and particularly in the standardization of sensitometric methods. This activity has been particularly noticeable in Great Britain, and the conferences held by the Royal Photographic Society have served to bring to a focus the present status of the subject, its problems, and the importance of an international agreement on sensitometric standards. While it may be questioned if the standards proposed by the Congress will be universally accepted, the discussion will nevertheless have served a very valuable purpose in bringing the subject more prominently to the attention of research workers and the photographic world generally.

As regards the conferences held at the Royal Photographic Society, one of the most promising features was the general recognition, on the part of those taking part in the discussion that methods suitable for research work might not be so well adapted for general commercial use, and that while the plate speeds of commercial plates should be determined with all possible accuracy, methods are required which are adapted to the demands of the manufacturer in order that they may be generally adapted. From the viewpoint of the practical photographer it is not so important that the standards adapted be such as lead to the very highest accuracy, it is far more important that the methods be adapted which will lead to their universal use by the manufacturers in order that an exact comparison of the speeds of various plates may be exactly

---

[65] *Phot. J.* 1924, 64, 363.

SUPPLICATION. F. A. Kunishige.

comparable. While the decisions reached by the committee on sensitometric methods at the 6th International Congress of Photography may not receive final recognition, a period of six months having been allowed for further discussion by those concerned, it is quite possible that the decisions of the committee will be accepted in the main, if not in detail.

In the discussions on the standard light source both at the conference held by the Royal Photographic Society and at the International Congress of Photography in Paris, more attention was paid than heretofore to the employment of electric sources. At the R. P. S. conference, J. W. T. Walsh of the National Physical Laboratory after discussing the requirements of a standard light source for sensitometric purposes, and with particular attention to the color temperature of the flame, concluded that either a carbon arc of the Forrest type, or a gas-filled tungsten lamp operating at a color temperature of 2950 degrees, formed the best standards for general laboratory use.

If the arc be adapted, further refinements in its construction must be made in order to render the light accurately reproducible at all times. If a gas-filled bulb is employed, its absorption in the ultra-violet must be defined. The use of filters for securing the same spectral distribution as daylight is not considered to be advisable, since all such filters are deficient in ultra-violet transmission, unless of the liquid type, the use of which is inconvenient in a commercial laboratory[66].

Renwick also urged the adaption of the gas-filled lamp run at a specified efficiency[67]. Doctor Robert Luther recommends the use of iron resistances in hydrogen with such lamps in order to secure a constant voltage independent of variations in the voltage of the supply. When direct current is employed further correction for supply variations may be secured by the use of electrolytic condensers in parallel with the lamp[68].

At the International Congress of Photography further papers on the use of the gas-filled lamp as a standard were read by R. Jouaust, Director Laboratorie de Electrite[69] by Baillaud[70] and by Dr. A. Odencrants[71].

---

66. *Phot. J.* 1925, 65, 52.
67. *Phot. J.* 1925, 65, 57.
68. *Phot. J.* 1925, 65, 60.
69. *S. I. P.* 1925, 5, 122.
70. *S. I. P.* 1925, 5, 125.
71. *S. I. P.* 1925, 5, 125.

Dr. Helmuth Naumann describes a filter for use with gas-filled lamps in order to render the spectral distribution of the same comparable to daylight[72].

A modification of the Hefner Amyl-acetate lamp that largely prevents the wavering of the flame which has heretofore been one of the serious objections to the general use of the Hefner lamp as a sensitometric standard is described by Dr. Mariette Debeil of Ghent. The chimney described by Dr. Debil reduces the wavering of the flame to the point where it cannot be observed by the eye[73].

Magnesium ribbon has been suggested as a constant light source by several workers, but as the light emitted depends not only on the length and weight of the ribbon, but the way in which it is burnt, it has not found much favor as a sensitometric standard. Eder as long ago as 1904 called attention to the fact that the spectral distribution of magnesium ribbon burnt in air is almost exactly similar to that of daylight. This is a strong point in favor of its employment as a constant light source for photographic sensitometry, but owing to the difficulties of securing an exact reproducibility, it has never been employed to any extent. Eder in a paper before the International Congress of Photography stated that with certain precautions a new form of magnesium ribbon placed on the market by a Berlin firm when burnt in air gives a very satisfactory source for photographic sensitometry[74].

The only light source besides electric sources to receive serious consideration at the Congress was acetylene. Both Walsh and Fabre called attention to the favorable color temperature of acetylene and Baillaud and Jouaust presented a paper dealing specifically with the color temperature of the acetylene flame[75].

A new type of exposure mechanism employing reflected light entirely is described by Davidson and Balmain[76]. The apparatus consists of a number of strips of opal glass mounted at various angles to a uniformally lighted slit, the light from which is reflected by the strips of matt opal glass in various degrees of intensity according to their angle with the slit, on to the lens of a photographic camera and are reproduced on

---

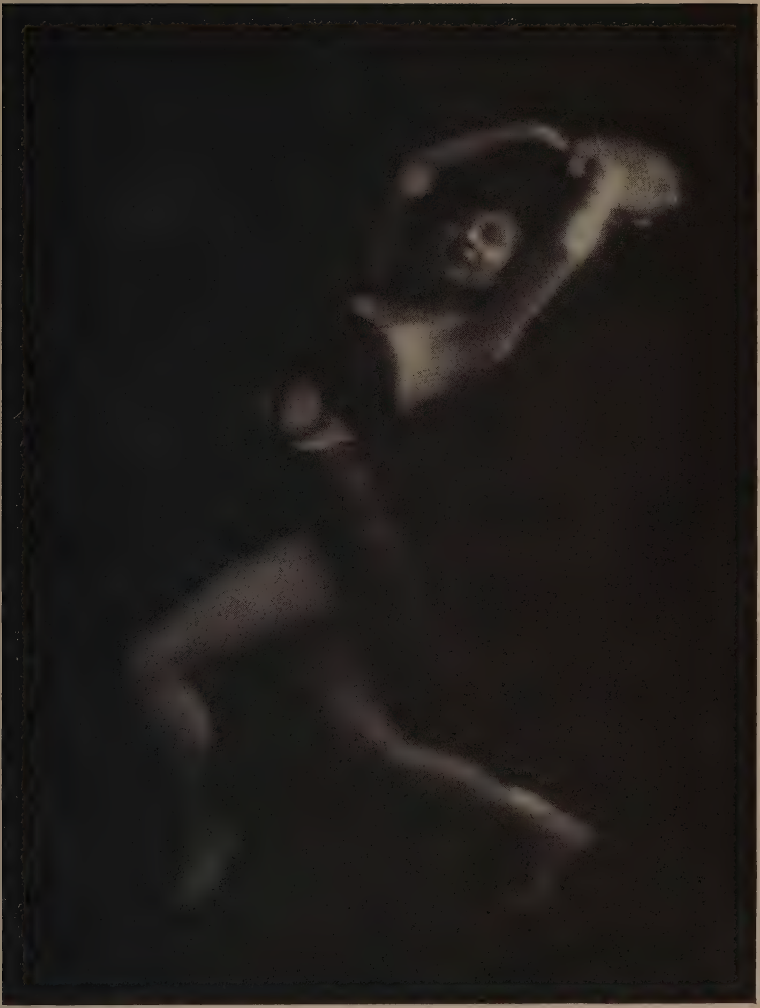
[72] *Phot. J.* 1925, 65, 348.

[73] *Brit. J. Phot.* 1925, 72, 411.

[74] *Brit. J. Phot.* 1925, 73, 444.

[75] *S. I. P.* 1925, 5, 123, 124.

[76] *Phot. J.* 1925, 65, 69.



TAMBOURINE DANCE. LOUIS FLECKENSTEIN.

the sensitive plate. This form of apparatus approaches more closely the conditions of ordinary photography than any existing exposure mechanism, and it is strange that it received no more attention in the discussion at the Congress or at the Royal Photographic Society, where the tendency was to bring up as objections such relatively unimportant points as the effect of the lens. Surely whatever the effect of the lens something of the same part is played by the lens in ordinary exposure in a camera, while the possible differences in various lenses might well be expected to be below the usual experimental errors, and is a matter which might be standardized quite easily.

In connection with the sensitometer described above, the authors compared results obtained with their sensitometer with sensitometers of the non-intermittent and intermittent types and with wedge apparatus. Their conclusions may be summarized as follows:

1. Non-intermittent exposure gives a higher gamma and a rounder foot to the curve than intermittent exposure.

2. Wedge apparatus gives greater variation than sector wheel exposures. Also a higher gamma and a rounder foot to the curve. They suggest that the instrument described by them would be particularly valuable in the investigation of the under-exposure portion of the curve, as it can be made to give an extended range of small increases in intensity[77].

Dr. S. O. Rawling in a paper before the conference on sensitometric methods held by the Royal Photographic Society reviewed the various exposure mechanisms which have been proposed, or which have been employed by various workers, and the principal objections to the same. He concludes that owing to the effect of intermittent exposure which, however, the work of Jones and Huse has shown not to be as important as was formerly supposed, intermittent exposure apparatus should be avoided and only apparatus of the type designed by Jones or Higson in which a continuous exposure is given should be accepted as standard. As a result of the work of Jones and Higson on the reciprocity light[78], it is no longer sufficient to simply plot densities against log exposures, but the actual intensity in the case of time scales or time of ex-

---

[77] *Brit. J. Phot.* 1925, 72, 475.

[78] *J. Opt. Soc. Amer.* 1923, 7, 1107.

AN INSHORE WIND. W. R. MAC ASKELL.

posure, with intensity scales must be given[79].

Renwick considers the ideal method would be to employ an intensity scale since such would approach more nearly to the condition of actual photographic exposure, but practical difficulties outweigh this theoretical advantage and the choice of non-intermittent time apparatus is preferable[80].

Uniform development was stressed by H & D and has ever since been regarded as one of the important phases of sensitometry. Absolute uniformity of development is undoubtedly impossible, but it is at least desirable with errors due to uniformity in development be kept as low as possible. Clark in a paper before the R. P. S. conference[81] draws attention to the fact that Callier, Seeman, Otashiro and others have shown that plates developed vertically in a tank show a difference in density between the higher and lower portions whether rotated or not. Mees and Sheppard used vertical development with rotation as did Walters and Davis.

Such methods have been found to be dependent upon the velocity of stirring[82]. Tray development was used by H & D and is favored by Renwick[83], by Bloch[84] and by Callier[85]. Bloch in 1921[86] suggested that a rubber roller coated with developer be rubbed over the plate. This method gives very uniform results, but temperature is difficult to control, and aerial fog due to oxidation of the developing solution constitute serious objections. Clark suggests what is probably a better method, namely, sweeping the emulsion with a soft broad brush during development.

Dobson[87] has suggested the use of a rectangular glass tank. The plates are fixed in position on the sides and during development a close fitting plunger is moved rapidly up and down. The clearance between the plate and plunger is about one mm. In this way a powerful eddy is produced on the surface of the plates, and the results are much more uniform than those secured by any other method of agating the developer. The most serious objection in the opinion of the present writer is that the removal of one or more strips at a time presents some difficulty. It should be possible, how-

---

[79] *Phot. J.* 1925, 65, 72.
[80] *Phot. J.* 1925, 65, 64.
[81] *Phot. J.* 1925, 65, 76.
[82] *J. Frank. Inst.* 1924, 198, 333.
[83] *Phot. J.* 1912, 52, 254.
[84] *Trans. Faraday Soc.* 1923, 19, 327.
[85] *Phot. J.* 1923, 53, 242.
[86] *Phot. J.* 1921, 61, 425.
[87] *Phot. J.* 1925, 65, 59.

THE LAST SHEAF. GEO. E. BELAIR.

ever, to provide for this, and when this is done there seems no reason why this arrangement should not prove entirely satisfactory.

As was shown by Bloch[88], plate speeds vary according to the developing agent used. It is, therefore, a matter of importance what agent be adapted as standard for sensitometric purposes. It is an open question as to whether it is well to attempt to consider any one particular formula as a standard, since different plates are better adapted to certain formulae than others. It is impossible, however, to divide commercial plates into even a number of classes with respect to their developing properties, and hence it is better to adapt a definite formula as a standard. This developer should act as nearly alike on all classes of plates as possible, should give undistorted curves for all times of development, should have a low temperature coefficient free from soluble bromide, or any organic substance, capable of seriously affecting the place curve, and with the least possible tendency to fog. Taking these facts into consideration the Royal Photographic Society committee on sensitometric standards recommended the well-known H & D pyro-soda formula, but diluted with an equal part of water and used without potassium bromide.

A. & L. Lumiere and Seyewetz after an investigation of the suitability of metoquinone, amidol, pyro, metol-hydrochinon, adurol and glycin recommended the adaption of metoquinone as a standard on account of its low temperature coefficient and small tendency to produce fog[89].

A great deal of attention has been paid recently to the subject of density measurement. Dr. F. C. Toy suggests that the standard value to be adapted for the density of a negative should be its contact printing density, since most negatives are used for contact printing rather than enlarging. He defines this term, *contact printing density,* as *"the common log of the number representing the intensity which will produce through the negative in contact with a printing medium the same effect on the print as unit intensity will produce through the glass only for the same conditions of exposure and development*[90]*."*

According to the same investigator there is only a very

---

[88] *Phot. J.* 1917, 57, 51.

[89] *Brit. J. Phot.* 1925, 472, 476.

[90] *Phot. J.* 1925, 65, 164.

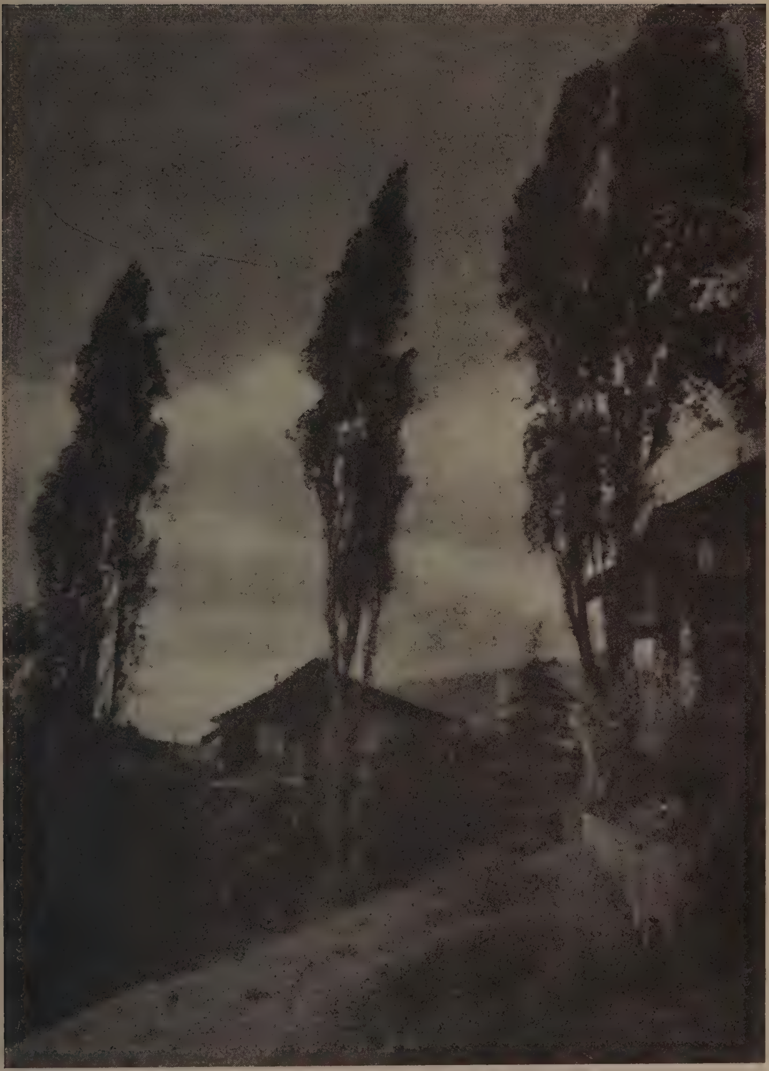


PHOTO STUDY. G. H. S. HARDING.

small variation in density due to the printing light and to the printing media. There is thus no foundation to the statement that the establishment of a standard printing density is impossible, except under very narrow conditions. Toy has shown in the above paper that densities measured on a contact opal type densitometer and the standard printing density are connected by a simple proportionality, even a density ranging from 0.1 to 1.8. The standard printing density and the proportionality between density measured by an opal glass densitometer does not vary with different types of negatives, nor with the printing media which have been investigated.

The Research Laboratory of Pathe Cinema has investigated the effect of the size of grain on density measurements. In addition to the use of coarse and thin grain emulsions they developed in developers favoring penetration, and thus acting largely on the surface. They find no strict proportionality in measurements made by parallel and diffused light, but the discrepancy between the two is always greater in the case of coarse grain emulsions. The mode of development has no measurable effect on the result. The distance of the opal glass from the negative was also investigated, and it was found that close contact between the two is necessary for accurate readings. Practical printing and enlarging tests under the same condition of light, exposure and material in parallel and diffused light show that only in the case of enlarging is there any real difference in the effecting of parallel and diffused light[91].

The suggestion of Toy that completely diffused light secured by the use of opal glass be employed in density measurement has not been allowed to pass without criticism. Bull and Cartwright who have continued their work on the scatter of light by photographic density repeat their statement made a year ago that density in non-parallel light has no exact meaning[92].

The greater amount of recent work on densitometric instruments has been in the attempt to develop an accurate and efficient physical densitometer using either the selenium, photoelectric or thalofide cell. We noticed in the review for last year the use of the thalofide cell by H. Schoen of the Eastman

---

[91] *Brit. J. Phot.* 1925, 72, 474.

[92] *Phot. J.* 1925, 65, 177.

BELLE JOHNSON.

Research Laboratory. Baker has described a densitometer using a photo-electric cell. It is claimed that the readings are independent of the battery voltage over the range within which the cell obeys Ohm's law and of variations in the light source[93]. H. Jort-Lowry and Blackwood have also described a densitometer employing a selenium cell, the reading being obtained from a galvanometer placed in the circuit[94]. Tykocinoki-Tykociner and Kung describe a new photo-electric cell which might find an application in densitometry[95]. D. H. Tuck has described a new form of instrument for measuring the intensity of reflected illumination which may find an application in the sensitometry of papers[96].

E. Stenger and G. Kyjawa have been comparing the Martens polarization densitometer with the Goldberg densograph. They find that over a density range of 0 to 2.88 the maximum difference in the readings of the two instruments is 0.1. The differences are not systematic. For accurate work the Martens is recommended, but the Goldberg densograph is sufficiently accurate for most laboratory work[97].

Schaum and Stoess have made an exhaustive study of the causes of error in the use of the Martens densitometer[98].

The H & D system when first brought forward aroused a whirlwind of criticism mostly antagonistic. However, as the fundamental basis of the method became more generally understood authorities were not slow in recognizing its real work. Of late more criticism of the H & D system has arisen, but not against the system itself so much as its lack of completeness. It is now realized that the H & D system is not an exact and comprehensive expression of plate speed, and that its amplification is necessary. Renwick is convinced that the H & D system is unsatisfactory in its present state as a complete expression of plate speed. He is of the opinion that the use of threshold values as supplement to H & D speeds obtained in the usual manner would be a step towards a more complete expression of the properties of commercial plates[99]. T. Thorne-Baker is also of the opinion that the practice of expressing the speed of a plate by one number must be given up. In a paper before the Royal Photographic

---

[93] *J. Sci. Imp.* 1924, 1, 345.
[94] *J. Opt. Soc. Amer.* 1924, 9, 43.
[95] *Sci.* 1924, 59, 320.
[96] *J. Opt. Soc. Amer.* 1924, 9, 303.
[97] *P. Ind.* 1924, 953 *and Zeit. wiss. Phot.* 1924, 23, 80.
[98] *Zeit, wiss. Phot.* 1924, 23, 52.
[99] *Phot. J.* 1925, 65, 188.

REFLECTIONS. ERNEST HOCH.

Society he described a system to divide the characteristic curve into two or three parts from each of which an approximate H & D speed is obtained[100].

According to Olaf Bloch the sensitometric data necessary for an adequate statement of the properties of an emulsion must include:

1. A set of characteristic curves with fog values for each period of development.
2. Separate plotting of the under-exposure portion of the curve.
3. Gamma infinities.

From which may be determined:

1. Speed of the plate throughout the entire curve.
2. Rate of growth of fog.
3. Cut and other information respecting the under-exposure portion of a curve.
4. The mode by which the under-exposure portion passes into the straight line portion and that into the over-exposure portion.
5. The rate of growth of gamma.
6. The latitude (so-called) of the emulsion[101].

Dr. Luther described a simple means of interpreting a set of curves representing various times of development by superimposing a diagram on a transparent support on which is marked data obtained by calculation from previous curves of similar nature[102].

W. A. Heydecker described rapid methods of determining gamma infinity, K and the time of development for given gamma, and for the determination of the temperature coefficient of developers[103].

DEVELOPERS AND DEVELOPMENT

Mr. L. F. Davidson has investigated the influence of the emulsion type, the nature of the developer, and the size of the developed grain. All grains show an induction period after the developer reaches them and before apparent action begins. This period varies with different developers. There seems to be a different period of induction for various grains, but this period is not dependent upon the size of grain. Development begins at points in the grain which spread and

---

[100] *Phot. J.* 1925, 65, 181.

[101] *Brit. J. Phot.* 1925, 72, 461.

[102] *Phot. J.* 1925, 65, 185.

[103] *S. I. P.* 1925, 5, 2.

DESOLATE ISLE.

WILLIAM GILCHRIST.

join together when the whole grain becomes blackened. Observation of several emulsions ranging from high to low speeds showed that for an emulsion of the same type the increase in average grain size on development is directly proportional to the H & D speed. In some emulsions the grains tend to develop in large clumps; in others there is a slight decrease in the projected area of the developed grain. A slow acting developer gives a more spongy grain than a vigorous one, but the difference is one of developing agents and not simply concentration[104].

Luppo-Cramer in order to determine if the thickness of the emulsion plays a part of sufficient importance to explain the differences in the action of rapid and slow reducers, exposed and developed under varying conditions a number of plates, some with the emulsion side to the subject, and some with the glass side towards the subject. He concludes that in cases where full exposure has been given, the thickness of the emulsion is not sufficient explanation of the difference which is found in the action of rapid and slow developers[105].

Interesting suggestions regarding the production of fog by the atmospheric oxidation of developing solutions have been made by E. Fuchs[106], who regards the fog as due not to the action of the oxidation products of the developer on the emulsion in a chemical sense, but to the chemiluminescence of such products of the reaction. Thus the formation of aerial fog appears to be exactly similar to that of light. The similarity in the two types of fog, however, is not conclusive evidence of the correctness of the chemiluminescence theory as chemical reagents such as arsenite, hydrogen peroxide, can cause fog in which case chemiluminescence can hardly be accepted as a satisfactory explanation[107]. Sheppard, Wightman[108], M. L. Dundon and J. I. Crabtree, who have investigated in some detail the fogging properties of some popular developers favor the chemiluminescence theory, and show that the use of desensitizers are effective in reducing the amount of aerial fog, while the ordinary tank fog is effected by desensitizers[109].

Amor finds that chemical fog other than aerial fog is not

---

[104] *Phot. J.* 1925, 65, 19.

[105] *Phot. Rund.* 1924, 61, 199.

[106] *Phot. Ind.* 1923, 634.

[107] *Clark-Brit. J. Phot.* 1923, 70, 717, 763.

[108] *J. Frank. Inst.* 1923, 95, 337.

[109] *Brit. J. Phot.* 1924, 71, 701.

WHERE MEMORIES ROAM. George E. Belair.
(Bromide)

reduced when a desensitizer is used as a separate bath before development, but only when added to the developing solution. He finds that only phenosafranine, pinakryptol and Basic Scarlet N are effective in this respect and of the three the first named is the most efficient[110].

Strauss has investigated the effect of repeated use of the developing solution on the density, gamma and apparent speed of the emulsion. In all cases there is a diminution of the effective speed of the emulsion as the developer is repeatedly used. With metol, however, there is but little change in gradation until the developing solution is virtually exhausted. With most developers there is a falling off of the higher densities on repeated use. Loss of developing power occurs long before the developer is oxidized to a considerable degree, the loss of developing power being due to the presence of the soluble bromide and to other reaction products[111].

The development of the image after fixation has been investigated by Leffmann[112], by Lumiere and Seyewetz[113] and by Luppo-Cramer[114]. Lumiere and Seyewetz have stated that no increase in exposure over that required for chemical development is required where an alkali is added to the fixing bath. Dr. Luppo-Cramer, however, cannot confirm this and claims that at least ten times the exposure is necessary and that even then the images are not so vigorous.

H. Hashimoto has patented a number of formulae for combined development and fixing[115].

Steward and Theimer patent a method of preparing paramidophenol derivatives suitable for use as developers[116].

W. G. Christiansen reports that p-amino-o-chlorphenol hydrochloride and the sulphite of its monomethyl derivatives are good developers similar to metol[117].

Sulzberger has patented the use of phenylhydrozylamine oxolate or formate or similar salts of aromatic hydroxylamines as developers[118].

The production of fog by sodium sulphide in developing solutions has been investigated by Dundon and Crabtree. After an investigation of probable sources of sodium sulphide, the authors conclude that its presence is more likely to be due to the action of certain living organisms such as fungi or bacteria, on the sodium sulphite which is thereby reduced to silver sulphide. When a developing solution is used continuously there is no trouble from sulphide fog since the dissolved silver precipitates the sulphide as fast as it is formed. It is only with developing solutions which are allowed to stand unused that sulphide fog becomes troublesome. A developer which gives sulphide fog can be revived by the addition of lead acetate which precipitates the sulphide as lead sulphide. No preservative has been found which will protect developing solutions from sulphide fog[119].

---

[110] *Brit. J. Phot.* 1925, 72, 183.
[111] *Phot. Ind.* 1925, 140.
[112] *Brit. J. Phot.* 1924, 71, 49.
[113] *Compt. rendus.* 1924, 178, 1765.
[114] *Phot. Ind.* 1924, 780.
[115] *B. P.* 201, 538.
[116] *Canadian Patent* 237, 842.
[117] *Photo Era* 1924, 53, 298.
[118] *U. S. P.* 1, 516, 161.

FIXING AND WASHING

According to Lumiere and Seyewetz the rate of fixing in hypo is increased by the addition of ammonium chloride only in the case of plates containing iodide, and the greater the proportion of iodide to bromide the greater is the increase in rapidity of fixing when ammonium chloride is added[120]. With most emulsions a 40 per cent solution of hypo fixes about as fast as lower concentrations with ammonium chloride, and is preferable to the latter owing to the danger of the formation of instable compounds with the hypo-ammonium chloride fixing bath.

A. E. Amor has investigated the efficiency of various hypo eliminators. Caustic soda may be used as an eliminator at a concentration of 0.2 per cent. Ammonium persulphate with sodium carbonate is more efficient than hydrogen peroxide, or potassium permanganate, and equally as good as a 2 per cent solution of caustic soda. There is no advantage, however, in the use of an eliminator since thorough washing for an equal time is equally as efficient[121]. Hickman and Spencer have continued their investigations on the washing of photographic products and have published a series of four papers on the subject within the current year[122]. It is found that with plates the diffusion of hypo from the emulsion follows the expotential law as has been assumed before by Elsden and Warwick. Experiments conducted with emulsion, however, showed that below 30 parts of hyposulphite to

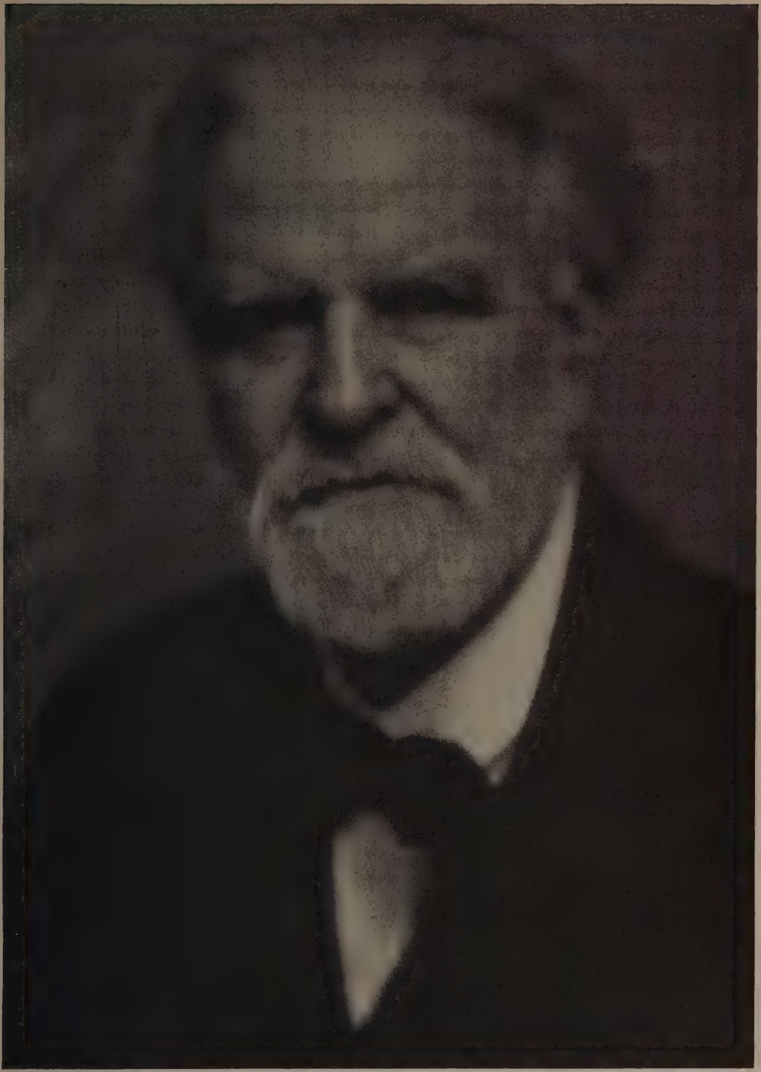
---

[119] *Brit. J. Phot.* 1925, 72, 171.

[120] *Rev. franc. Phot.* 1924, 5, 294.

[121] *Brit. J. Phot.* 1925, 72, 18.

[122] *Phot. J.* 1924, 64, 539 *and Phot. J.* 1925, 65, 443.



EDWIN MARKHAM. HILLARY G. BAILEY.

a million of water the diffusion of hypo is not expotential. No evidence of reversible absorption, however, was obtained under normal conditions. The influence of various plates, the use of various developing agents, and hardening baths on the rate of hypo elimination was also investigated. In the latest paper dealing with the rate of hypo elimination from papers it is shown that in this case the rate is not expotential as in the case of plates, and that the time required for satisfactory elimination of hypo is much longer than heretofore supposed. It has been generally thought that under identical conditions prints could be thoroughly washed in less time than plates, owing to the fact that the soluble salts might diffuse out from both sides of the emulsion. The author shows, however, that this is not the case and that in practice prints require much longer time for washing than plates. For thin papers not less than thirty minutes in a free current of water is advised, while in the case of thick papers not less than one and a half hours should be given.

Two forms of washing troughs designed particularly for cinematograph film are described by Hickman[123]. While designed for motion picture film the same principles might be applied equally well to the design of washing devices for ordinary photographic work, and it is a paper which should be studied with more than ordinary care by every manufacturer of such appliances, for no more inefficient apparatus is to be found in any branch of photography than that provided for washing.

REDUCTION AND INTENSIFICATION

G. Zegler describes a process of super-intensification which may be of value in photographing questioned documents for judicial purposes, or wherever one has to deal with weak impressions. The process described is a modification of the copper-silver method using cupric iodide solution stabilized by an organic salt. The advantage is that the intermediate image is not spontaneously oxidized during washing, and is not soluble in water. The silver content of the image may be increased nine times by repeated intensification with this process[124].

---

123. *Phot. J.* 1925, 65, 35.

124. *S. I. P.* 1924, 4, 86.

MT. WEBSTER. A. C. G. ALLISON.

Steigman recommends the use of copper thiocarbamide and silver, or silver sulphide, as a reducing agent for positives[125].

REVERSAL PROCESSES

Probably as a result of the commercial introduction of cinematograph apparatus for amateur use involving the reversal of the original film, considerable interest has been displayed in the production of direct positives by reversal. A. Boer describes a process for the production of reversed images which essentially may be termed a combination of the bromoil and Pinatype processes. The negative is first bleached in the usual bleaching solution employed for bromoil after which it is dyed up with a suitable dye. While not a new process it is one which will no doubt attract a number of workers, owing to its simplicity and lack of uncertainty as to the finished result[126].

W. F. A. Ermen describes a method of making reversed images by exposing an ordinary plate in the usual way, developing and washing well in complete darkness, then exposing to light and developing in a bath of phenylenediamine. In this the residual silver halide is reduced and an image composed of silver and Indophenol blue is produced. The silver image is then removed in ferricyanide-hypo leaving behind a transparent blue image especially suitable for projection[127]. This method differs from numerous well known methods simply in the physical rather than chemical development of the second image.

Dr. R. Namias recommends that for securing direct positives for use in the Resinopigmentype process the plate be desensitized in phenosafranine and developed in a metol-hydrochinon developer. It is then rinsed and bleached in potassium permanganate acidified with sulphuric acid. This again is only a modification of older methods; the point of departure being in the desensitization of the plate prior to development[128].

Langer describes the theoretical requirements of the reversal process and outlines a process which it is claimed allows of considerable control but no details are given[129].

Patents on reversal processes were granted the Eastman

---

[125] *Phot. Ind.* 1925, *p.* 34.

[126] *Phot. Ind.* 1924, *p.* 482 *and Brit. J. Phot.* 1924, 71, 276.

[127] *Brit. J. Phot.* 1925, 72, 147.

[128] *Il. prog. fot.* 1924, 31, 195.

[129] *Phot. Ind.* 1925, p. 83.

MOONLIGHT—KIYOMIZU. T. OKAMOTO.

Kodak Company[130] for the process used in the Cine-Kodak; to Pathe Cinema[131]; to G. Koppmann[132] and to R. Luther[133].

SILVER PRINTING PROCESSES

During the past year Dr. F. Formstecher has published a number of valuable papers dealing with various phases of printing on silver printing-out-papers. Among other things he has investigated the influence in the color of the light used in printing on the contrast of the print[134].

He finds that the maximum sensitiveness of silver chloride papers lies in the violet, and that of silver citrate in the blue-green so that on printing under a yellow screen increased contrast is secured with collodio-chloride papers, which are rich in silver chloride, and softer results with papers rich in silver citrate, such as matt albumen. Investigations on the effect of moisture on various papers showed that variation in the moisture content of silver chloride P-O-P papers had but little effect. Chloro-citrate papers, however, give more contrasty results with bluer tones when dry and softer and redder tones when moist. Practical methods of humidifying papers to make use of these facts in practice are given[135].

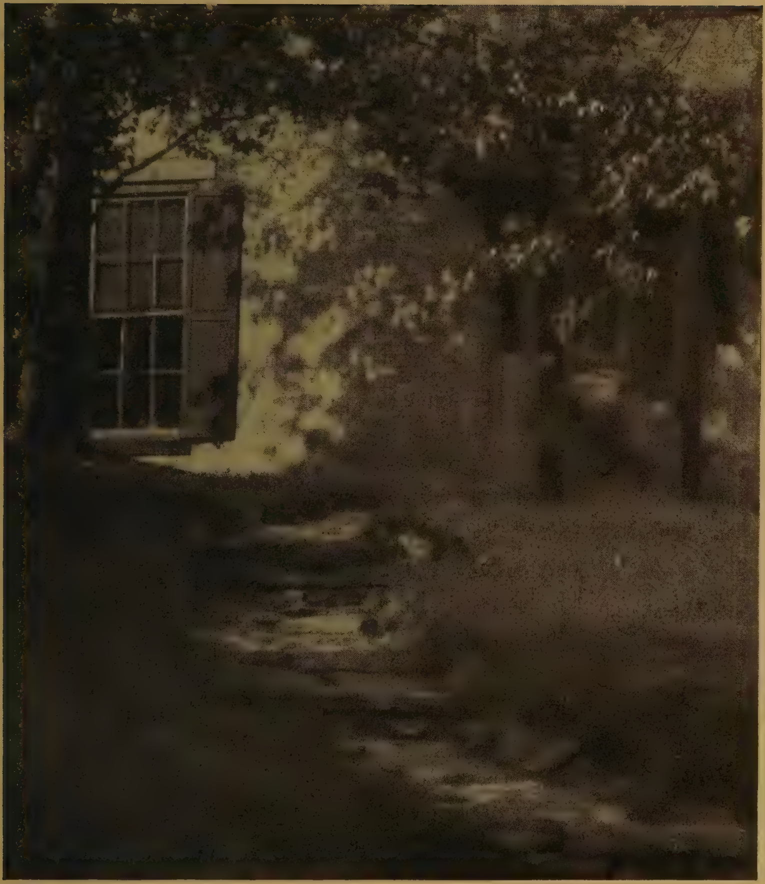
According to Dr. Formstecher the range of tones in P-O-P printing papers is lengthened by the use of a weak alkaline fixing bath containing 50 grams of hypo and 2 grams of sodium carbonate to the liter of water. The loss of density on fixation is not so great with the alkaline fixing bath and the tone is slightly redder than that of the plain hypo bath[136].

Lumiere and Seyewetz state that P-O-P papers may be toned with selenium instead of gold by immersion for 2-4 minutes in a 32 per cent solution of hypo to which has been added a solution of 3 per cent selenium dissolved in a 20 per cent solution of sodium sulphite at the rate of 5 cc of selenium solution to each liter of hypo[137]. The toned image is said to consist of a mixture or complex of silver and selenium, no sulphur being present[138].

Comparatively little attention seems to have been paid to the study of the sensitometry of printing papers during the past year.

---

130. *B. P.* 218, 632.
131. *B. P.* 211, 431.
132. *G. P.* 395, 805.
133. *G. P.* 396, 485.
134. *Camera* (*Luzern*) 1924, 3, 143 *and* *Brit. J. Phot.* 1924, 71, 96.
135. *Camera* (*Luzern*) 1923, 2, 47.
136. *Phot. Ind.* 1924, 855.
137. *Rev. franc. Phot.* 1924, 5, 93.
138. *S. I. P.* 1924, 4, 86.



MORNING SUNLIGHT. Carl C. Distler.

The agitation abroad for a more definite expression of the speed and degree of contrast of commercial papers, which followed the work of Dr. Glover on the factorial development of papers, seems largely to have subsided. Formstecher has discussed the sensitometric constants of printing papers and given methods of determining the threshold values, effective gradation range and maximum density of collodion papers, and L. P. Clerc has described a modification of the Fabry-Jobin densitometer for the measurement of the reflection densities of photographic prints[139]. Formstecher records the results of some investigations of the effect of the intensity of the illumination on tone contrast on development papers. Test strips of bromide paper exposed under a Goldberg wedge to light of various intensities controlled by alteration of the working distance, or the use of diaphragms showed no alteration in contrast that could be regarded as being beyond experimental errors. Tests with collodion printing out paper, however, showed that contrast was much less with stronger illumination[140]. Strauss in referring to the effect of the intensity of illumination on gradation states that no definite rules can be established as each emulsion acts as a law unto itself[141].

IRON PRINTING PROCESSES

Formulae for blue printing papers which print very rapidly and may be printed by incandescent lamps have been published by R. E. Kwech[142], while A. J. Jarman has described an iron sensitizer adapted to paper, sateen and silk[143].

A German firm, Durener Fabrikpraparieter Papiere, Renker und Co. has been granted a patent for an extra rapid blue print paper suitable for use with gas filled electric lamps[144]. Other patents granted the same firm during the past year cover the preparation of blue print paper with enhanced keeping qualities[145]; a positive blue print paper[146] and the use of a baryta coated paper[147].

BICHROMATED COLLOID PROCESSES

Buri describes a new (?) process of printing with bichromated colloids which is very similar in its general features to the Resinopigmentype process of Namias[148]. The starting point is a bichromated gelatine relief to which pigment of any desired color is applied by means of a brush. J. Sury has patented[149] a printing paper consisting of a colloid and a temporary coloring matter made sensitive to light and capable of being dissolved by a dilute acid when the colloid coating is made spongy. The paper is sensitized with potassium bichromate and after exposing is developed with hot water. The powdered pigment is then dusted on the surface and adheres to the spongy portions. Three-color images may be superimposed to obtain color prints from three-color sensation negatives.

---

[139] *S. I. P.* 1925, 5, 28.

[140] *Phot. Ind.* 1924, *p.* 673.

[141] *Phot. Ind.* 1924, *p.* 907.

[142] *Amer. Phot.* 1924 *p.* 461 *and Brit. J. Phot.* 1924, 71, 491.

[143] *Brit. J. Phot.* 1924, 71, 34.

[144] *G. P.* 388, 511.

[145] *G. P.* 403, 586.

[146] *G. P.* 403, 902.

[147] *G. P.* 390, 164.

Mente criticises the Sury process on the grounds that only the deep shadows are reproduced, the half-tones and high lights being weak and wanting in vigor, while the negative must be the same size as the positive and the powder is difficult to apply and no means are provided to keep it from rubbing off. He advises a modification of the process[150].

Under the title of bromocollography, Maurer describes a process intermediate between bromoil and collotype, the gelatine relief being inked by means of a roller. Two reliefs may be used; one a high relief to produce the strong print, the other a low relief for the soft, long-scale print, or different colored inks may be used if desired[151].

Namias has been granted a British Patent for his Resinopigmentype process[152] and has given full particulars of the process in a paper in the *Photographic Journal.*

Duvivier describes a method of oil printing using as a base a print on gelatino-chloride paper which is printed, washed, then bleached and passed through an ammonia bath after which it is inked up in the same way as a bromoil print[153].

M. Schneeberger has revived the "water color bichromate" process of Dillaye and gives directions for working the process[154].

Howard Farmer condemns as retrogressive the two bath carbro process worked out by Garon and adopted as the standard by the Autotype company. He advises a single

---

[148] *Brit. J. Phot.* 1924, 71, 377.

[149] *B. P.* 216, 860 *and G. P.* 405, 494.

[150] *Camera (Luzern)* 1924, 3, 69.

[151] *Bull. soc. franc. P.* 1924, 11, 85.

[152] *B. P.* 205, 092 *and Photographic Journal* 1924, 54, 401.

[153] *Camera (Luzern)* 1924, 3, 28.

[154] *Bull. soc. franc. P.* 1923 *p.* 162 *and Brit. J. Phot.* 1923, 70, 596.

THE HAUNTED WOOD. J. ARTHUR LOMAX, F.R.P.S.

bath process in which the degree of contrast is controlled by the addition of chromic acid[155].

H. J. P. Venn describes results of experiments on the bleaching and tanning of prints for bromoil, and advises the use of two separate baths; one for bleaching and another for tanning. Formulae for these baths are given[156]. He suggests that the following equation more accurately expresses the reaction which takes place in the bleaching and tanning of the bromide print for the bromoil process than does that of Schrott given by Mayer in his *Bromoil Printing and Transfer:* (American Photographic Publishing Company) $3Cu_2Cl_2 + K_2Cr_2O_7 + 7H_2O = 2KCl + 2CuCl_2 + 4Cu(OH)_2 + 2Cn\ (OH)_3$.

Prett advises that weak prints which are intended for bromoil be redeveloped after bleaching, washed and again bleached in order to secure a more vigorous print[157].

Wurm Reithmayer criticises the theory advanced by Mebes in his textbook regarding the influence of the structure of the surface on the absorption of ink, and the quality of oil and bromoil prints[158]. Mebes suggests that the absorption of ink is dependent upon the size of the spaces between the particles of gelatine. The author is of the opinion that the surface absorption theory explains matters more satisfactorily; the absorption of ink depending upon the roughness of the gelatine surface which is greatest in the areas in which the gelatine is most strongly tanned.

According to Mayer it is unnecessary to over-ink the shadows when making bromoil transfers in order to secure the same range of tones as the original subject. A complete transfer of ink is secured if the transfer after having been run through the press is removed from the paper, and then replaced in position and run through the press the second time[159].

H. Zapernick in a rather extensive paper reviews the usual difficulties met with in working the bromoil process, explaining the nature of these troubles and their prevention[160].

Richer has investigated the blackening law for plates coated with bichromated gelatine and black Chinese ink. The plates were exposed to sunlight and the resulting densities measured with a photo-electric densitometer. It was found that the straight-line relationship between exposure and density was much longer than that of any silver halide emulsion; practically no under- or over-exposure period being observed within the range investigated[161].

---

[155] *Brit. J. Phot.* 1924, 71, 503.

[156] *Brit. J. Phot.* 1924, 71, 427.

[157] *Phot. Rund.* 1924, 61, 63.

[158] *Phot. Rund.* 1924, 61, 147, 169 *and* *Phot. Ind.* 1924, 886.

[159] *Phot. Rund.* 1924, 61, 200.

[160] *Brit. J. Phot.* 1923, 70, 645, 656.

PRELIMINARY EXPOSURE

The subject of preliminary exposure of plates and films as a means of reducing the exposure required has been considerably to the front during the past year. The idea of preliminary exposure is not new, and was brought out quite prominently in the days of collodion. The appearance of gelatine emulsion with its higher sensitiveness made it unnecessary and Eder in his *Handbuch*[162] after going into the matter thoroughly comes to the conclusion that the increase in sensitiveness does not compensate for the risk of fog.

P. V. Neugebaur finds that there is a constant increase in the sensitiveness of emulsions exposed in orange light, but that a blue-green light transmitting from 480-510 is better. An ultra-rapid plate increased 6.4 times in speed with but faint fog, while an ortho plate increased 3.6 times in speed[163]. Herr Frerk, the editor, states that tests made by others show that exposures can be reduced at least one-third by preliminary exposure of the plate.

F. Brun finds that the effect of preliminary exposure is greater with some plates than others, and that the growth of fog with increased exposure is greater in the case of some emulsions than others[164].

While Neugebaur and others find a difference in the effect of lights of various colors, Luppo-Cramer finds that the color of the light used for the preliminary exposure has little or no effect. He records an increase of 20 degrees Eder-Hecht or 2 to 3 steps on the Chapman Jones plate tester without fog[165]. He also gives an excellent summary of the earlier literature on the subject.

Scheffer has examined the effect of preliminary exposure on the plate curve. The effect of pre-exposure is to raise the lower densities, decreasing the inertia. Objects which would fall within the under-exposure portion of the curve are thereby brought up into the straight-line portion. It is immaterial when the supplemental exposure be made before or after the main exposure. He confirms Luppo-Cramer's statement that the color of the light used for the preliminary exposure plays little or no part in the final result[166].

---

[161] *Zeit. wiss. Phot.* 1924, 23, 61.

[162] 1912, *I.* 111, 316.

[163] *Photofreund* 1924, 4, 1.

[164] *Camera (Luzern)* 1924, 3, 39.

[165] *Phot. Ind.* 1924 p. 527.

In a general review of the subject in the British Journal of Photography, it is pointed out that a short exposure after the main exposure has only about half the effect of an equal exposure given before the main exposure[167].

Kutzleb after an exhaustive study of the subject in the laboratory, and in practice comes to the conclusion that no increase in sensitiveness of practical value is obtained[168].

DEATHS

Among the dead of the year mention should be made of Dr. E. Konig, who was responsible for a number of color sensitizers; Friedrich von Voightlander, of the well known firm of Voightlander & Sohne of Brunswick; Dr. B. Homolka, active in the investigation of the development of the latent image with various organic compounds, on solarization, and of late with the subject of desensitizing; Nahum Loboshez, prominent in radiography, and among the first to draw attention to the advantages of duplex films for X-ray photography; Sumar Ray, an authority on the subject of photomechanical reproduction processes. In the United States, B. J. Falk, the well known professional of St. Louis, and Clarence H. White, the well known pictorialist. It is fitting that we who live to enjoy the results of their work pause a moment in reviewing the progress of the year to pay tribute to those who have made such progress possible. *Requicscat in pace.*

---

[166] *Photo. Ind.* 1924, 775.
[167] *Ibid.* 1924, 71, 555.
[168] *Photo. Ind.* 1925, 137.

WOODLANDS IN WINTER. RAYMOND E. HANSON.
(Bromoil)

AN EMULSION FOR PRODUCING PHOTOGRAPHS UPON OPAL, IVORY, PAPER AND WOOD

By A. J. JARMAN

WITHOUT boiling, or long digesting, the following emulsion may be readily made, and will keep in good working condition for two or three weeks, although it will give the best results if made and used in the course of a week. For photographing upon wood it may be used two or three weeks after preparation. Of course, all the operations of mixing and filtering must be carried on under a non-actinic light, not necessarily ruby, yellow light will do. Several four or five ounce amber colored glass bottles must be procured, washed thoroughly clean, dried and fitted with good corks.

Formula for emulsion

A

Re-crystallized nitrate of silver	240 grains
Distilled water	4 drams

Grind these together in a small stoneware, or glass mortar. Pour this into a small amber colored glass bottle marked A.

B

In another bottle place U. S. P. plain collodion	2 fluid oz.
Denatured alcohol	1 fluid oz.
Sulphuric ether	1 fluid oz.

Shake this well so as to secure complete incorporation

C

Denatured alcohol	2 fluid oz.
Chloride strontium	64 grains

D

Denatured alcohol	2 fluid oz.
Citric acid	64 grains

Take two ounces of B in an amber colored bottle, add thereto of A ½ dram. Shake the mixture well, then add half a dram of denatured alcohol, and of C one dram, a few drops at a time, shaking the mixture well after each addition.

DIXIE. Wm. A. Alcock.

Now add of D 30 drops. Shake the mixture well, allow to stand for an hour, then filter the solution into another clean amber colored glass bottle, using a small glass funnel, packed lightly with a small tuft of absorbent cotton. The solution will now be ready for use. Strips of Baryta coated paper may be coated without any previous preparation for direct printing, but for transfer to ivory, or opal, a few sheets of Baryta coated paper, about 8 x 10 inches, must be coated with the following substratum:

Distilled water	12 fluid oz.
Gelatine	180 grains
White granulated sugar	1 dram

Cut the gelatine into strips, allow to soak in the twelve ounces of distilled water for an hour, then add the sugar, and melt in a stoneware jar by placing it into boiling water, stir with a glass rod, and when the gelatine has become completely melted, strain it into a porcelain, or enamelled iron tray, that has previously been heated by filling it with hot water.

After being well drained a piece of voile, or a double thickness of fine cheese cloth, may be used for straining the solution through. Now, float a sheet of Baryta coated paper face down upon the warm gelatine solution, lifting one end so as to disperse any air bubbles that may be formed by touching them with the tip of the finger. Allow to float until the sheet lays quite flat, then lift it by one corner, drain carefully so as not to form any air bubbles by allowing the one corner of the sheet to touch the side of the tray, then suspend it by a pin or drip in a suitable place away from dust to become dry. A number of sheets may be prepared thus, and dried, for they will keep indefinitely if packed face to back of each sheet in an ordinary photographic printing frame upon a sheet of glass, card kept under frame as to be quite flat.

To coat this paper so as to enable the emulsion film to strip, all that has to be done is to take a piece of this prepared paper, fold it so as to cut a 5 x 8 strip, cut it, then fold the edges up so as to form a tray, about a quarter of an inch all around, placing it upon a piece of cardboard by touching the corners with sealing wax, folding the opposite corners so as to form a lip. Now, pour upon the center a pool of the filtered emulsion. Allow it to run evenly to each corner, then pour off at one end where the lip was formed into another clean amber colored bottle, drain well, then suspend to dry in a *dark room* free from dust. When dry, which will take about one hour, coat the same sheet again, only this time draining the excess of emulsion from the opposite corner, suspend again to dry, and when completely dry remove the paper from the cardboard support by means of a bone or celluloid knife, cutting the folded edges all around with a pair of scissors, when several sheets may be packed face to back, and kept under pressure in a printing frame until required for use.

PRINTING

Take an ordinary negative, place it in a printing frame, then place thereon a small sheet of the sensitive paper, close the back of the frame, and expose to sunlight, or daylight. In the course of half a minute to one minute the progress of printing may be examined, by opening one half of the back of the printing frame, turning over half of the print. If it presents a picture well done, it may be removed from the frame, then laid aside in the dark for finishing or it may be finished right away. The opal glass or ivory must be well cleaned with a weak solution of common washing soda only slightly warm, to remove any greasy finger stains caused by handling, then well rinsed under the faucet, and placed in a small clean rack to become dry.

TONING AND FIXING

The print must now be carefully washed in several changes of clean, cold water, allowing two or three minutes to elapse between each change of water. As soon as the washing is complete the toning of the print may be accomplished by placing it in the following solution:

Filtered water	15 fluid oz.
Chloride of gold	2 grains
Saturated solution of borax	2 fluid oz.

Under a yellow light place the washed print into this, rock the tray, then watch the change in color. A purple brown color is well suited. At this stage place the print into clean cold water, rinse twice, then place it in to the fixing solution made as follows:

SENTINELS OF THE AIR. SOPHIE L. LAUFFER.

Ordinary tap water	10 fluid oz.
Hyposulphite of soda	1 oz.

As soon as the hypo is dissolved place the print into the solution for ten minutes after which it may be washed in a tray in running water for ten or fifteen minutes, then suspended to dry. When dry the print may be cut to size for transfer.

TRANSFERRING

All that has to be done now is to place the print into warm water, *not hot.* In the course of a minute or less the collodion film containing the picture may be easily slid off upon the opal glass, or ivory, while *in the water,* aided by a small camel's hair brush, there being just enough gelatine mixture upon the underside of the film to cause it to adhere to opal or ivory, when it must be smoothed down upon the ivory or opal by a careful use of the camel's hair brush, then stood aside to dry. Any coloring or spotting, upon the print may be done now. A final coating of anyl acetate collodion may or may not be used to assist the artist. A coating of this lacquer will preserve the delicate photograph from injury by damp, and resist effectually ordinary handling.

PRINTING UPON WOOD

This kind of printing is accomplished by first coating the surface of the wood with albumen, and zinc oxide. A few drops of albumen is placed upon the surface and rubbed all over by using the base of the thumb of one hand, then a small quantity of zinc oxide is placed upon the wood, and a continued rubbing all over the surface as was done in distributing the albumen, first rubbing lengthwise, then crosswise, until a very even and extremely thin white coating is obtained. Quite a knack of dexterity must be acquired by practice to do this.

When the wood is coated—an almost infinitesimal coating—and dried, the emulsion may be poured upon the center of the wood in a pool, then conducted to each corner by tilting until an even coating is secured, the excess of emulsion being returned to the bottle from one corner, the wood being rocked backwards and forwards to secure an even coating, then dried. When dried a print is produced from a negative in just the same way as printing on paper, only the printing frame must be made to suit, by being much deeper than for a paper print. The time of exposure in sunlight from an ordinary negative

BARNS. MILDRED RUTH WILSON.

may be from one to two minutes, when the wood may be removed, with a very brilliant print upon it. It must then be waxed all around the edges and back by being brushed over with a solution of *paraffin wax* in benzole. The object of this is to prevent the water from penetrating into the back and sides. The coating becomes set in about two or three minutes. The wood print is then washed under the faucet, and placed face down into a strong solution of common salt for about two minutes. The object of this is to convert the trace of free nitrate of silver into chloride of silver, which is easily removed in the fixing bath.

FIXING SOLUTION FOR WOOD

Hyposulphite of soda	4 oz.
Tap water	20 oz.

As soon as the hypo is dissolved the wood print may be placed into it direct from the salt bath without washing. Allow the wood to float in the hypo solution face down for five minutes, then remove it and wash under the faucet for five minutes in a running stream of water, then remove it, place it on end to drain. Place a piece of blotting board on the print and rub down with a soft rag on the back, wipe the edges and back dry, then allow the wood print to become dry under a fan, or dry spontaneously. When dry, take a small tuft of absorbent cotton well wetted with *wood alcohol.* Rub this all over the surface of the print so as to remove the collodion film which it will quickly do. Then finish off by rubbing with a tuft of clean absorbent cotton. It will be found that the collodion has been removed, and the print left both *on* and *in* the surface of the wood. If the print is required for engraving a reversed negative must then be used.

SHEEP GRAZING.

IRVING BERKEY.

BROMOIL TRANSFERS IN NATURAL COLORS

By CHAS. H. PARTINGTON

THE title of this article will no doubt draw the attention of quite a few photographic workers in general and the bromoil enthusiasts in particular. There is nothing really new in the idea of transfers in natural colors, as quite a few workers have made them by inking alternately on the same print, and some have used the three-color process. The latter method is to be described in this article.

To begin with, let me warn those to whom the process is new, that if properly handled, the results are very good, but if all conditions are not correct, some startling surprises will come before your eyes. No matter what results are obtained you will find this three-color process very interesting, and productive of an education in color values as well as light and shadows.

Actual bromoil, or transfer work, will not be described, as it would make a very long treatise. Former issues of the *Annual* cover these processes, or text books can be procured from photographic dealers. It is essential that bromoils and transfers have been made previous to attempting color-work.

Allow me to state that the work is best when prints are made by contact from the original negatives. Large pictures are better than small ones, as a rough transfer paper can be used thereby presenting a broad effect. Small prints require more accurate registration. Enlarged negatives offer too great a chance for error in values, and direct enlargements are subject to the same trouble to quite an extent.

Considering as outlined above, that large prints are best and that they should be made by contact, it means the use of at least an 8 x 10 camera. If such is not available try out the largest at your disposal.

The only additional equipment necessary over regular photography or bromoils, is a set of three-color filters, red, green and blue. Prints are best if made without any black or neutral

STILL LIFE. FRED WILLIAM CARTER.

color, but as this fourth printing helps in some cases, it is wise to have a good ray filter to use for making a negative corrected for all colors in regular monochrome work. Panchromatic plates are, of course, essential. It may be necessary to run a few trial exposures to determine if the relative exposure values as listed in each box of plates are suitable.

A still life subject is best. Lighting should be strong and full. Prominent shadows are advisable, but care should be used that they are not void of detail. The lighting can be controlled best at a north window of large size with very white cardboard, or paper, for a reflector. Get a brilliant yet soft image, on the ground-glass.

For a start, endeavor to obtain articles for the still life where the colors are fairly true in red, green, blue and yellow. This is suggested in order that the first negatives can be easily compared as to elimination of the opposites to each particular filter. If the subject contains blues that are grayish, reds that tend toward brown, etc., you will have difficulty comparing exposure values until more experience has been had.

As a little preliminary education, take a picture in colors, such as can be found in any magazine advertisement or cover, hold it in bright daylight and examine it through each of the three filters. Note how the red filter makes blue appear black while green does the same to red, etc. This gives an idea of what will happen when the negatives of a subject are made. In straight photography the negative, as everyone knows, shows black and white reversed. In color photography, instead of reversing black and white, the negative reverses the original colors as regards printing but, of course, in values of light and dark.

The negative made through the red filter will be minus blue and green, and that made through the blue filter will be minus red and green, while the one made with the green filter will be minus red and blue. Anything white will expose heavily with any filter. The same applies to red with a red filter, etc. When the three black and white prints are made from the separate negatives, examine each one and you will note the following: The print from the red negative will be white, wherever white or true red existed in the original subject. Reds varying from the true color will be in proportion to the shade. Green and blue will show black, or gray, according to their intensity. From this you can see that although the print is from a red filter it

SNOW DRIFT. G. S. AKASU.

must be inked with the opposite colors, which would be green and blue, or in other words, tri-color blue, which is a mixture of both or blue-green. The white portions will not take ink and, therefore, red and white will show as white on the transfer from this print.

The print from the green negative will show white for green and white. This print is minus red and blue, so must be inked in a combination of the two colors which is magenta, a red color with a decided tendency toward blue.

The print from the blue negative will show white and blue as white. Reds and greens will be dark. The ink for this print is tri-color yellow, a very brilliant shade. The print being made with a blue filter is minus red and green which, when combined, produce yellow.

When transferring, it is best to leave one color dry before applying the next. Different opinions exist as to which color should be transferred first, but I have found the best results are obtained printing red first, blue second and yellow third. After the three colors are transferred, one on top of the other, the print may look a little lifeless, in which case the addition of a black transfer from the negative of a regular ray filter will give body and snap to the shadows. The print for inking with black should be a very light one, or too much of the dark ink will destroy the colors.

The main thing in three-color bromoil transfer is the matter of registration, but this is easily accomplished by pins set in the ground-glass frame of the camera. Take ordinary pins and clip off the heads to such a length that when driven in the edge of the ground-glass frame, they will extend about one-quarter inch over the face of the plate. One in the center of each of the four sides is sufficient. With these pins set rigidly in place, a thin line shadow will be cast on each plate when the exposure is made. The four lines will be black on the print and in identical relative position to the subject. Before prints are bleached for inking, they should be laid face down over a printing light and the registration lines marked on the back. When first transfer is made, extend the marks to the paper on which picture is being made and match the marks on the prints that follow. This method guarantees exact registration of the three images.

Three-color bromoil transfers are interesting and instructive. It is hardly possible to produce absolutely a true rendition of the original subject, but if exposure, development, inking, etc, are carried out on a basis of theoretical correctness, the finished picture will show up very well indeed. Experimenting with the process is interesting, and extends an education concerning colors and their values in monochrome.

ANGUS BASIL

THE PANCHROMATIC PLATE IN LANDSCAPE PHOTOGRAPHY

By COLIN J. UNSWORTH

ONLY a few years ago it was customary to hear a universal plea for more landscape work, and to deplore the lack of it in our premier photographic exhibitions and salons. It is, therefore, pleasing to note since the days of Robinson and Horsley Hinton, with that fine pictorial worker Alexander Keighley as a connecting link, landscape photography is gradually coming once more into its own.

In England, the East Anglian School, the Welsh School and many well known keen and enthusiastic workers in London, and the provinces, can be readily called to mind as likely to give a good account of themselves in the world's landscape photography of today and the future. In America several workers of note are gradually making their mark in this interesting section of camera art, even although "stunt" pictures have from time to time obscured their true outlook of artistic landscape work and its sympathetic rendering.

There is one phase of which is rapidly receiving more and more attention from pictorialists, and that is the rendering of landscapes *en plein air,* as the French so aptly put it. An interesting composition of landscape, which may possibly occupy a third of the picture space, with the remaining two-thirds filled with a fine sky arranged to complete the whole composition, is a favored combination.

As we all know, in the old days, owing to the limitations of their plates, workers had to utilize one negative for the landscape and another for the sky. A transparency of each would then be made and the two finally combined in one enlarged negative for printing in carbon or platinotype. With the advent of bromide paper, it became a practice to print in a sky to the landscape on the one sheet of paper. In some cases the resulting prints were a success, but in very many glaring untruths of lighting effect and suitability of sky were apparent, and today it is comparatively easy at any exhibi-

THE HEADLAND.

COLIN J. UNSWORTH.

tion for a photographer of even small experience to pick out the landscapes into which skies have been introduced as against those landscapes with land and sky secured on the same plate at the time of exposure. Orthochromatic plates with a X5 or X10 filter helped in a measure to ease the problem of obtaining skies in the negative, but time exposures are necessary and prolonged, sometimes bringing in their train under-exposure of the landscape portion, unless exposure and development are carefully adjusted.

Fortunately there are photographers and chemists, who are never satisfied unless the best is at their service, and spare no pains to secure it. Panchromatic plates or films have been one of the results of this, so to speak, photographic unrest, and although many still cling to the older established sensitive material, yet at the present time many more pictorial workers are becoming expert in the use, and vitally aware of the increasing utility for their work of that fine modern product of science, the panchromatic plate or films.

With these fine materials, in conjunction with appropriate filters, such as X2, X3, or even X6, using a Reflex Camera—exposures in the hand are readily possible on subjects of the open landscape type, and completely solve the earlier problems.

The true landscape enthusiast goes out for his skies on the plate every time, and a cloudy but sunny day with huge lazily drifting cumulus clouds will find him hard at work securing those fleeting spontaneous expressions of nature which are so admired in really high grade work. Composition, lighting and patience are three principal factors in successful open landscape picture making, mixed with a personal love of nature, and a clear vision of the beautiful. Patience may be put first to study the composition or arrangement, to analyze the transient effects of lighting, as given by the cloud shadows, and finally to wait for the necessary cloud form, of shape and balance which shall complete the composition, and bind the whole structure.

Photography under these conditions becomes a most fascinating relaxation, and the satisfaction on returning home with half a dozen plates exposed under these conditions immeasurably outweighs a "bag" of a dozen or so haphazardly exposed without due regard to these essential factors for suc-

DRIZZLING. T. Okamoto.

cess. To the uninitiated the use of the suitable filter for certain subjects is sometimes a matter of indecision, but fortunately there is obtainable from the Ilford Co. of Ilford, England, and also probably from other makers of screen termed the Panchromatic Vision Filter. The subject is first viewed through this filter to observe the effect or correction in monochrome, such as would be given by the use of the panchromatic plate or film unscreened, and then each correcting filter is in turn interposed between the Panchromatic Vision Filter and the eye, until the subject under inspection contains the relative luminosity desired in the print.

It must be remembered, however, that each Panchromatic Vision Filter must be made for the plate used, also that the correcting filters must be also made for that plate as well. Much of the dissatisfaction or non-success with panchromatic work is caused by the use of one maker's filters with another's plates, and no better advice can be given than to use the filters made by the plate maker whose brand is used. For the pictorial worker no set rule can be laid down as regards density of filter to use, as in his case he wishes to emphasize or suppress, as he pleases, and the desired result is accordingly so secured.

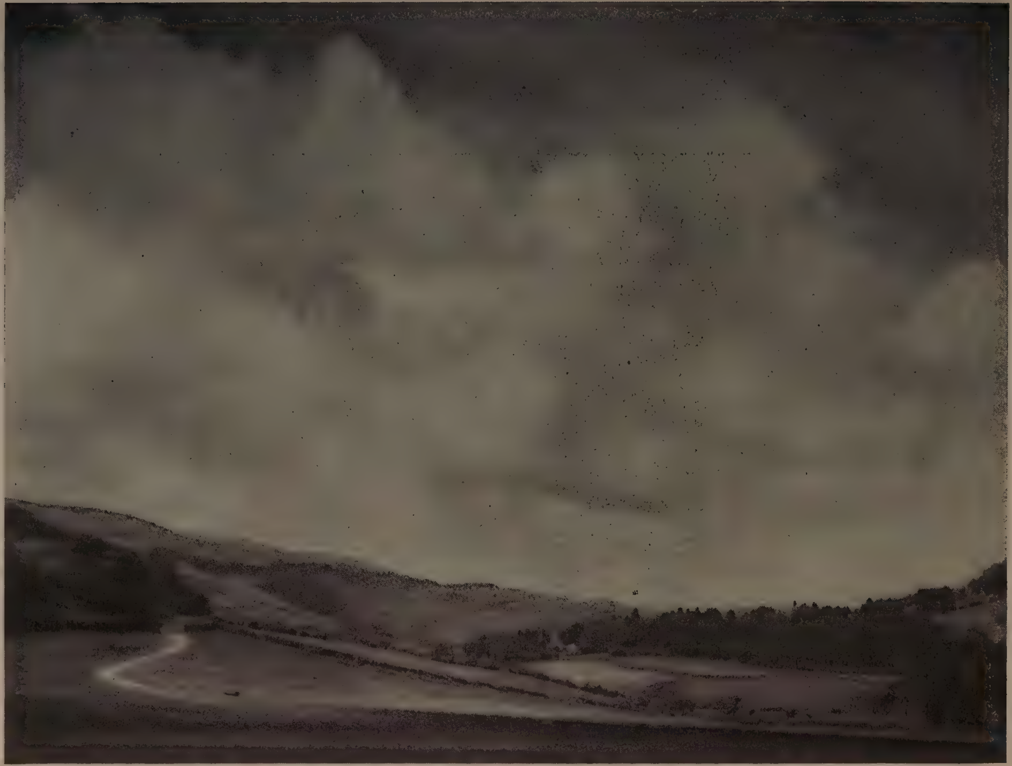
Speaking generally, however, a filter which requires X2 or X3 times meter exposure on a panchromatic plate can be considered as suitable for most landscape or seascape work. The use of too deep a filter destroys that atmospheric quality so dear to the heart of the artistic pictorialist—one of the greatest charms in a landscape. Atmosphere must be retained in order to separate, and differentiate between near and distant planes. Because so and so has made a successful salon picture of a few trees and a dramatic sky, don't set up your camera and copy his work. The subject must appeal to our own sense of the pictorial, and must contain in it some element which arouses a desire to express it. Analyze what this appeal is, whether it is color only or fine contrasts or decorative effect. A pleasing arrangement of line or mass, the harmonious or contrasting of light or shade should be examined with care, as these often form the basis of a successful theme. Remember that the middle of the picture is the weakest spot, and that more satisfactory balance is obtained if the main subject is on one side, and the other filled with some secondary object, or cloud, which balances the whole, and leaves no sense of emptiness.

In the type of open landscape treated in this article, the subject interest usually falls in the middle distance, so that a foreground broad in treatment, comparatively quiet in tone should be utilized to emphasize and enhance the beauty of the principal point of interest and give that sense of space and air which is so essential.

Looking back to the early days of photography and the pictorial work of the pioneers, one cannot help having a profound respect, and admiration for the fine work produced under immense difficulties of material and process. Technique then was a fine art—it had to be to produce the finest results, but at the present time one often wonders whether an equally technically fine negative has mothered some of those admittedly successful pictures we see now in our salons, or whether cleverness of hand is largely embodied. Nevertheless first class technique must be the basis of picture making, and applies with equal weight to pictorial landscape work as to every other section of photography. References in certain books to pictorial under and over-exposure must often mystify the novice reader, after his teaching of correct exposure.

Paradoxical as it may seem, however, only the fine technician ever successfully and deliberately under or over-exposes, and correctly develops his negatives in order to secure a certain play of lighting, tone or shadow massing. Therefore, it is evident technique is a paramount factor which must come first before really serious pictorial landscapes are attempted with panchromatic plates. With the now more scientific methods of development available, the development of a panchromatic plate is at once easy and certain. Some workers favor the time and temperature method in a dish, others use tank development, both of which in intelligent hands produce first class results.

Remembering that a softly developed well graded negative should be aimed at in landscape work, a few tests of a favorite developer at different times at 60°, 65°, 70°, 75° will soon give the worker all the information it is necessary to know. Landscape negatives all practically fall into one class of development; the exceptions are usually specially dealt with in a batch of their own.

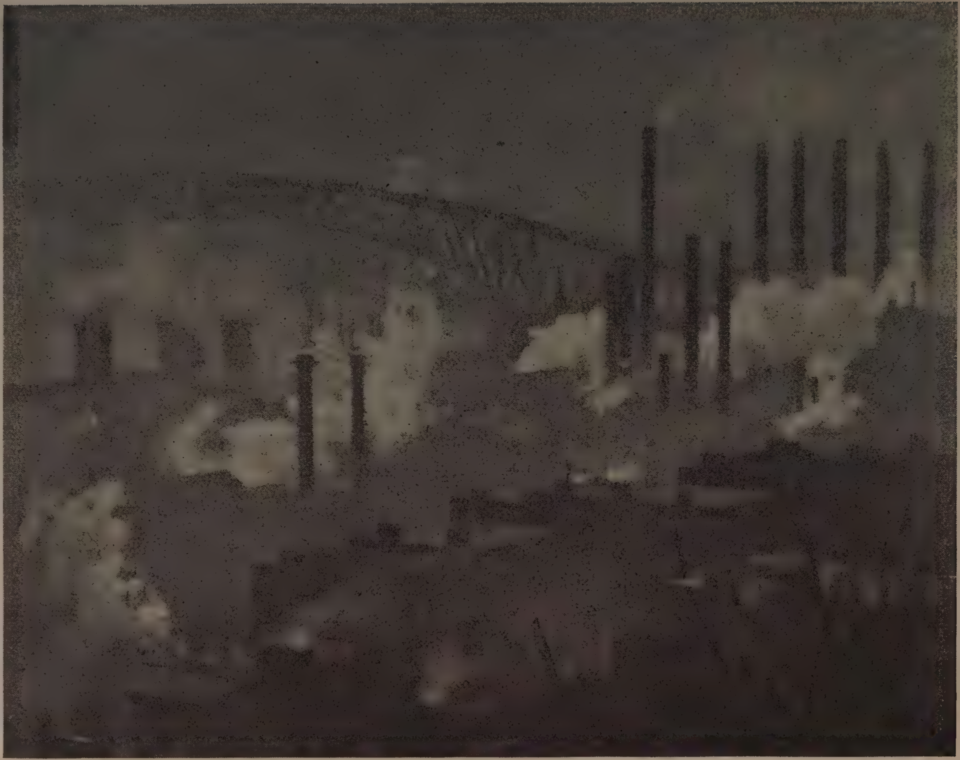


DRIFTING CLOUD.

COLIN J. UNSWORTH.

In conclusion it must be added that in the space allocated it is not possible to more than outline such a big subject as landscape photography. Considerations of cameras, lenses, processes, composition, lighting, skies, etc., would form almost complete articles in themselves, so the present note must be treated as a suggestion only for closer personal investigation along an avenue of photography which will well repay pursuit by the serious worker.

ISLAND OF TAHITI. JOSEPHINE RAMAGE



PITTSBURGH. BENJ. W. ROBINSON.

GELATINE RELIEF, AND ITS CONTROL

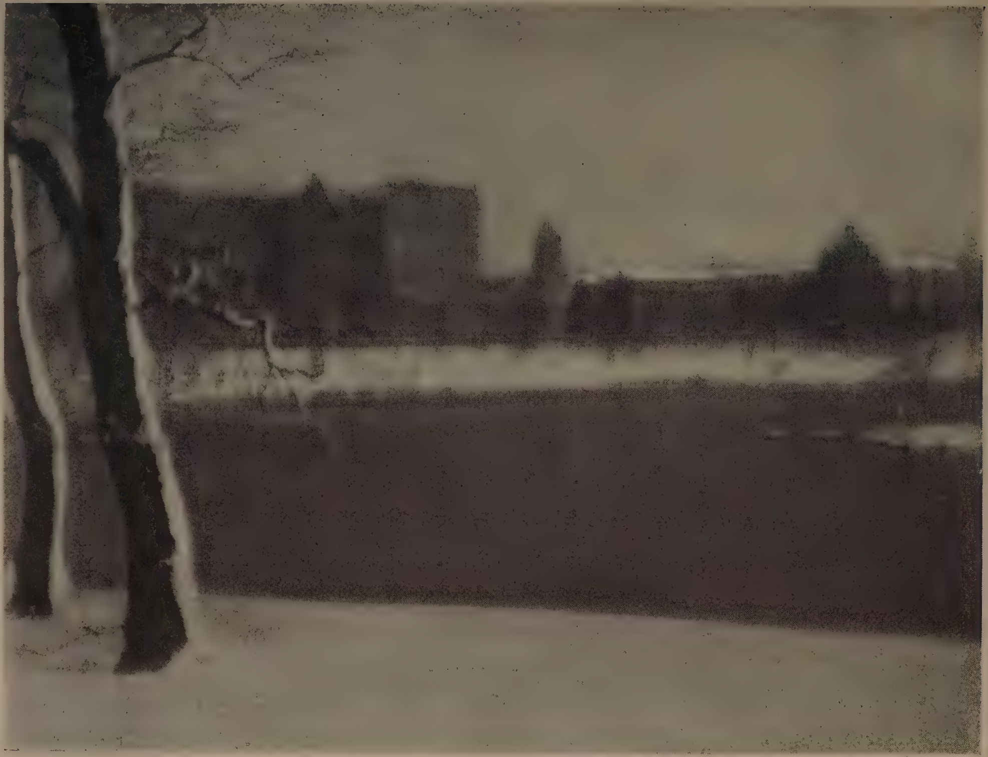
By G. L. ROHDENBURG

MANY years ago the observation was made that under certain conditions, which were apparently largely matters of chance, a considerable degree of relief of the photographic image was demonstrable in developed plates while still wet. There have been many attempts to apply this phenomenon to a commercial usage, and several of the proposed procedures have been patented in this and other countries. Those who may be interested in these processes are referred to various text books dealing with photographic procedures, and to the files of the Patent Office. The object of the present paper is to present the results of some investigations conducted by the writer.

Gelatine, as should be well known to photographers, belongs to that class of substances termed colloids. As a colloid it shares with some others, for example, gum acacia, certain physico-chemical characteristics—thus it swells in cold and melts in hot water. When gelatine is treated with a bichromate salt, it in common with gum arabic, possesses the following characteristics after exposure to light. Where the light strikes the gelatine in full force, the gelatine becomes insoluble in hot, and does not swell in cold water, and will absorb a maximum amount of oil in which a pigment may be incorporated. Where no light has reached the bichromated gelatine it retains its original characteristics, *i.e.*, it swells in cold, melts in hot water, and absorbs a minimum amount of oil. Between the two extremes there are all gradations.

In relief work we are concerned only with the ability of bichromated gelatine to swell, while in manipulative print work we are concerned either with the ability of the gelatine to take up oil (bromoil process), or with its ability to cause dusting powders to adhere.

In common parlance, solutions are still spoken of as acid or alkaline, depending upon whether the solution turns red litmus blue, or blue litmus red. Such was previously also

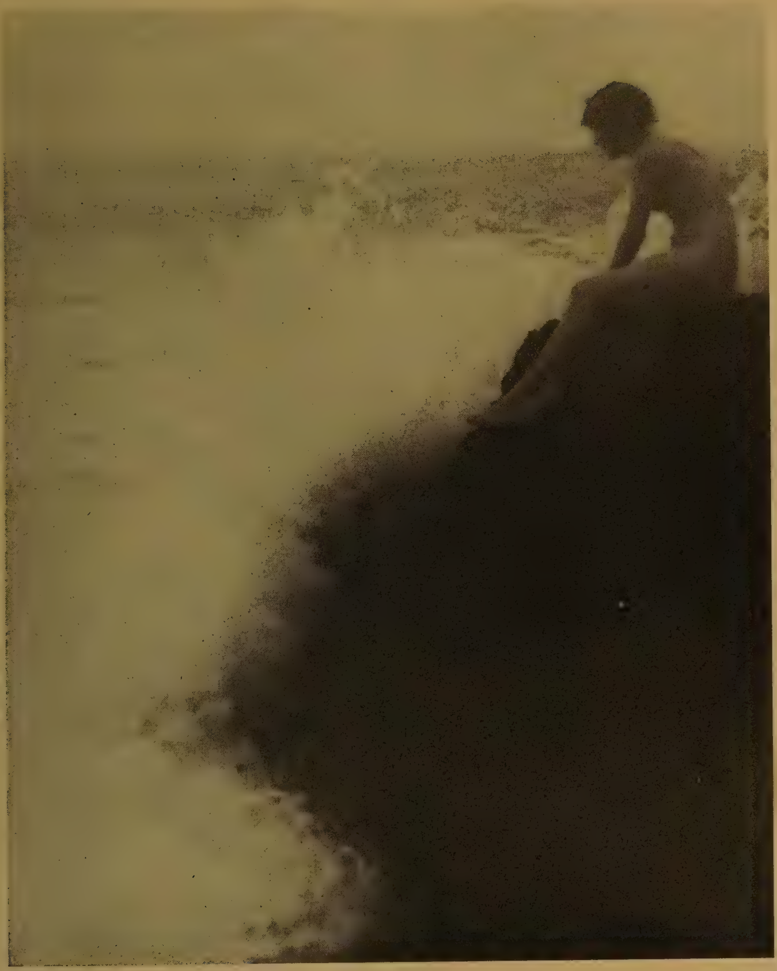


WINTER MORNING. FLOYD VAIL, F.R.P.S.

the custom amongst chemists, until Sorenson introduced a totally new conception of alkalinity and acidity. This investigator with others, amongst whom were the Americans, Clark and Lubs, devised a system whereby acidity or alkalinity could be much more delicately measured. Litmus paper might be compared to a yard stick, while the new methods are analagous to delicate calipers. For measuring minute dimensions one uses the calipers, not the yard stick. One might inquire the necessity for such exactitude in photochemical reactions, and the answer would be that investigations have shown that unbelievably minute differences in the reaction of chemical mixtures profoundly influences the end products.

Today the trained chemist, when a substance is neutral, expresses that fact by saying that the substance has a Ph. value of 7 (Ph. is the symbol of a mathematical formula the details of which do not concern us here). All values above 7 are alkaline, and all below are acid. Suitable indicators have been found so that differences of one tenth of a point can be easily distinguished. Furthermore, our present conception of the reaction of a substance is now based upon an electrical formula so that a substance in which the plus charges equal the minus charges is said to be isoelectric. Those who desire to follow this subject further are referred to the volume by Clark and Lubs, the title being "The Determination of Hydrogen Ions," Williams and Wilkens, publishers.

The degree of swelling of gelatine is absolutely dependent upon its reaction, hence the importance of the foregoing paragraph. According to the investigations of Loeb, gelatine when it is isoelectric swells but little when placed in cold water, but as the solution in which it is placed is made more acid, swelling increases with the acidity up to a certain point. When the solution is made more alkaline swelling also occurs reaching a maximum at a definite point. The maximum swelling under acid conditions is greater than that under alkaline conditions. Figure 1, which is modified from Loeb, illustrates the point graphically. In order to attain maximum swelling, therefore, the entire reaction, and all of the reagents, must be so adjusted that all are of the necessary Ph. value. How this is to be done is shown in the following paragraphs.



THE ROARING SEA.
(Bromide)

Louis A. Goetz.

The first step is to make an isoelectric gelatine so that one may have a definite starting point. However, those who possess chemical knowledge and skill can omit this, and having determined the Ph. value of the gelatine with which they intend to work can adjust it to a Ph. value of 3.1, using hydrochloric acid for that purpose.

Take 50 grams of gelatine (Cooper's granulated preferred), and place it in three liters of 128th normal acetic acid, at a temperature of 10° C stirring frequently. After 30 minutes decant the supernatant acid, and replace with an equal amount of fresh acid. After a further lapse of 30 minutes repeat the process for the third time. The third batch of acid is drained off, and the gelatine is washed with three liters of distilled water at a temperature of 5° C. A funnel is then prepared by lining it with a fine mesh clean linen, and the gelatine filtered. As it adheres to the linen it is again washed with five liters of distilled water at 5° C. After the final washing the gelatine is spread on a clean glass slide and dried.

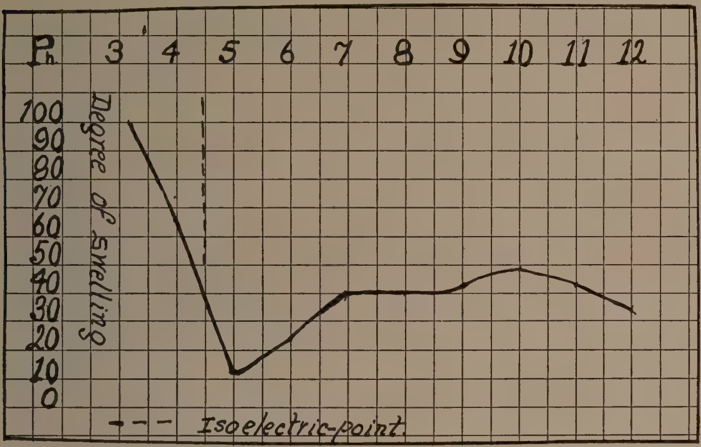


Figure 1.

The isoelectric gelatine is then changed to the proper Ph. value by dissolving 5 grams of the dried gelatine in 100 cc. of distilled water to which has been added 0.8 cc. (eight tenths of one cc.) of decinormal hydrochloric acid. Melting is hastened by the application of gentle heat. Cleaned glass plates are then coated with the gelatine after the routine fashion, the gelatine being poured until the surface tension breaks down as indicated by the gelatine running off the edge of the plate. The writer has had his gelatine and plates prepared for him in a highly suitable fashion by the Eastman Kodak Research Laboratories.

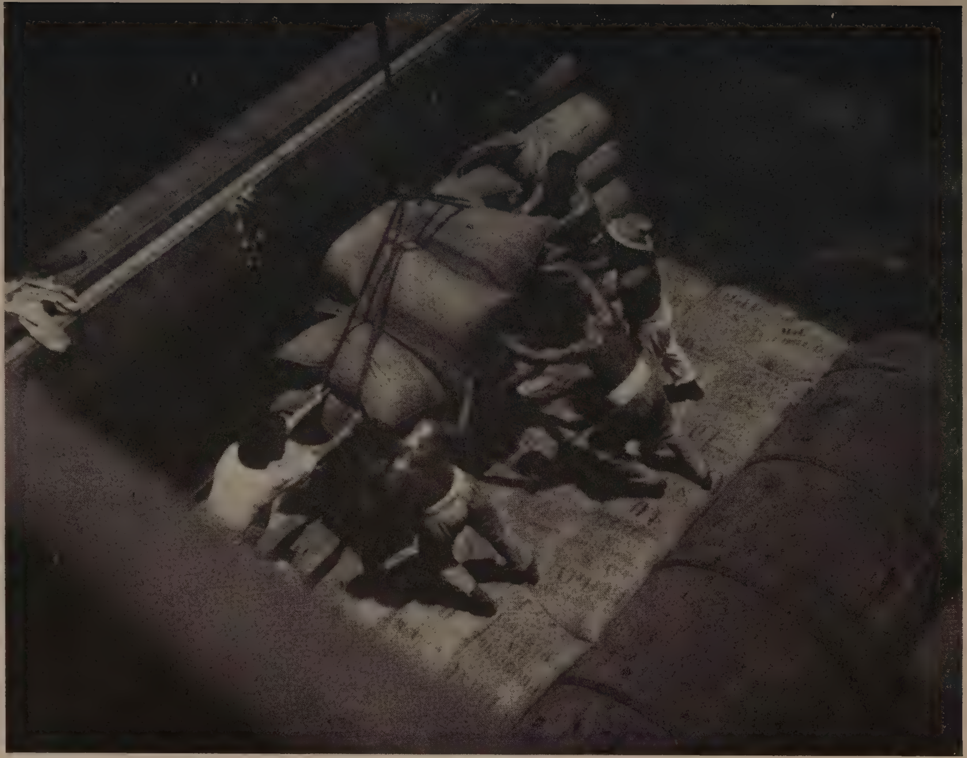
Sensitization of the plate is accomplished by painting, or dipping the dried plate in the usual fashion in a solution with the formula: distilled water 100 cc., decinormal hydrochloric acid eight tenths of one cc., ammonium bichromate 1.5 grams. The solution should be preserved in a dark-colored bottle.

The sensitized plate having been dried, and a suitable negative having been selected, an exposure is made equivalent to a slightly over-exposed print on a printing-out paper. Both over and under-exposure reduce the degree of relief, and prolonged over-exposure may reverse the image, making the portions which would ordinarily be in relief sunken, and vice versa. Since the action of light on bichromated gelatine continues after the light has been withdrawn it is advisable to proceed shortly to the swelling of the plate.

The swelling is accomplished by completely submerging the plate in distilled water 100 cc.; tenth normal hydrochloric acid 0.8 cc. Soaking is continued until the maximum degree of relief is obtained as indicated by the first appearance of stress lines, *i.e.* (hair line like cracks), in the gelatine at the edges of the plate. Maximum swelling, is, of course, optional for with some negatives more attractive effects are obtained with less than maximum swelling.

The next step is the transfer of the relief to Plaster of Paris. In a discarded cut film, or plate box, the negative, drained of its excess of soaking solution, is placed gelatine side up. On this is gently poured Plaster of Paris made with the grade used by dentists, and of a consistency resembling thick soup. The filled box is then struck repeatedly and sharply on a table so as to force all air bubbles to the surface. It is then set aside for from twelve to twenty-four hours to harden. When hardened, a knife blade inserted at the corners between the plaster and the plate, together with gentle leverage, readily separates the two.

There are several tricks in negative making which materially assist in obtaining good results. Exposure, develop-



CARGO.

DR. ARTHUR NILSEN.

ment and lighting should be such as to secure maximum contrast, and if possible there should be illumination from behind to accentuate the outline of the subject. Swelling of the plate may take from thirty minutes to forty-eight hours, and slightly warming the soaking solution accelerates the process. The soaking solution is best discarded after using for one plate. The plate may be repeatedly swelled, and we have obtained as many as six impressions from one plate.

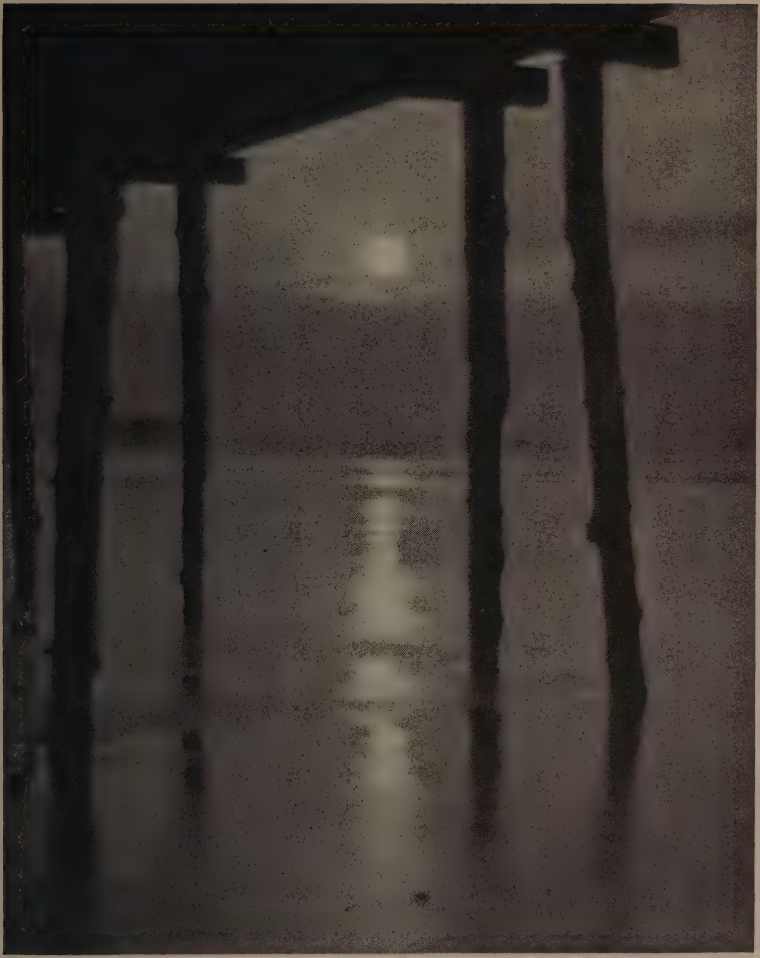
The plaster image is next converted into a metal image. This may be done by electroplating the plaster with a thin deposit of copper, remembering that the impression in the plaster is sunken, and that a very thin deposit is all that is needed otherwise the image is lost. The better way is to use the plaster as a matrix, and cause a heavy electrolytic deposit of copper (one eighth inch to one sixteenth inch) to be formed. This method brings out the final image in relief. For the technique of electroplating the reader is referred to Bloom and Hogabloom, Principles of Electroplating and Electroforming," publishers, McGraw Hill Company.

The copper impression having been made there are many possible manipulations, the metal can be colored from black to brick red, through the blues and greens to platina, or it can be plated with silver or gold. The various technical steps are described in Metal Worker's Handybook, by Brandt, publishers, H. Carey, England.

Another manipulation having artistic possibilities in capable hands, is to make the original print from a positive, thus obtaining a sunken impression in the final copper, the plaster being used as a matrix. This sunken image can then be filled with suitable enamels and vitrified.

If it is desired the soaked bichromated plate may be inked over and prints made by transfer. Under such conditions it is advisable to make two impressions, one from a negative, the other from a positive for one is at times much more effective than the other.

The basic principle which controls the amount of swelling of gelatine is applicable also to the manipulative prints processes. Maximum swelling of the gelatine, in terms of bromoil means minimum absorption of the pigmented oil, *i.e.*, the prints refuse to be inked. Minimum swelling of the gelatine produces the reverse, the print inks all over. The



EVENING JOHN ALLEN.

ideal point lies midway. This point can be controlled by suitable modification of the gelatine with which the paper is coated, of the paper stock, and of the bleaching solutions. It is with the hope that one of the commercial houses will follow the matter further that these notes have been made public.

If the manipulation of paper and inks is accepted as a legitimate field of photographic endeavor it is but a step to that of metals. The metal prints are permanent, they show just as fine gradations as do paper prints, they offer far greater opportunity for artistic expression. Figure 2 is that of a set of book racks in which the wood base has been ornamented by the attachment of a metal print of one of August Weiman's bas reliefs from a World War memorial.

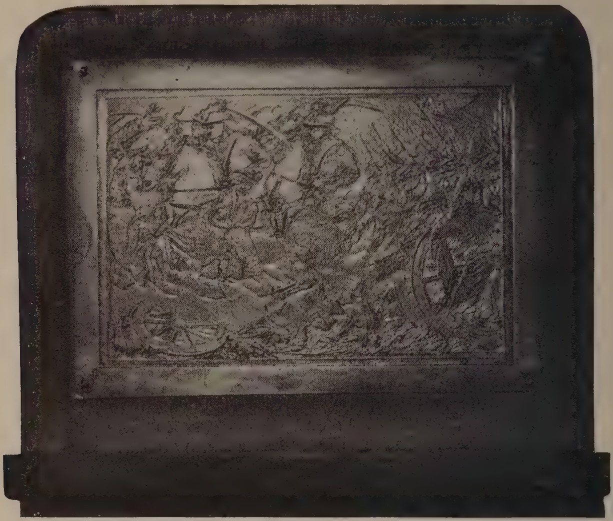


Figure 2.
Illustrating article "Gelatine Relief and Its Control," by G. L. Rohdenburg.

H. BEDGGOOD.

EXPERIENCES WITH THE CARBRO PROCESS

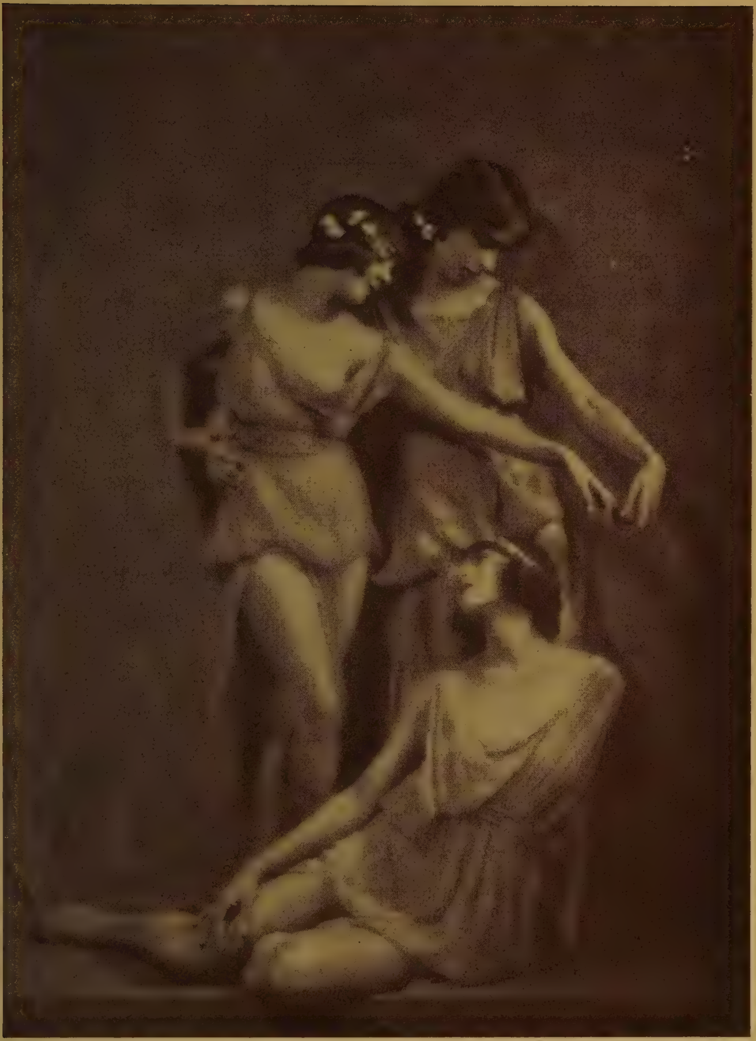
By H. E. JELTSCH

IN talking with many members of the photographic fraternity and in looking over the catalogues of the various salons I have been surprised to find that only a relatively small number of workers are making use of the fascinating carbro process in their exhibition work. The opinion seems to prevail that the process is unnecessarily fussy and the results not uniformly dependable. I know from my own experience this impression is wrong.

To the uninitiated, reading the instructions, as they first came out in *American Photography,* the process seems rather formidable, but in actual practice it boils itself down to a few essential precautions which present no special difficulties, except to the unfortunates, whose "fingers are all thumbs." The formulae I use are those of the Autotype Company, unaltered in any way, except that I cut down the formula for the "B" or modulator bath. It calls for twenty-two ounces of formaldehyde, and I have seen people conscientiously go and buy themselves two pounds of this commodity in order to make up the formula. This would last them about three or more years, hence the reduction.

The first desideratum for success is a perfect bromide print, The print should be correctly exposed, not a second more, or less, and should be developed to the limit. If a print stays in the developer (it is immaterial what kind) for several minutes, and is still a good bromide print, though a trifle dark, it is fit to make a carbro from, otherwise it is most decidedly not. A print that would yield a good color in any of the sulphiding processes, or in bromoil, can generally be considered good for carbro.

The second essential point is contact. The bromide print, assuming that it has been properly fixed and washed, is soaked in cold or room-warm water for twenty minutes or more, and



GRECIAN GIRLS. Nicholas Ház.

a sheet of the carbon tissue is immersed in the sensitizing solution "A" for three minutes. This time applies to all colors, except red chalk, which requires six minutes' immersion. All Autotype colors available will give good results, with the exception of Italian green which suffers in the process. I hear that the Autotype Company is experimenting with a new Italian green for carbro, but to my knowledge it has not appeared yet.

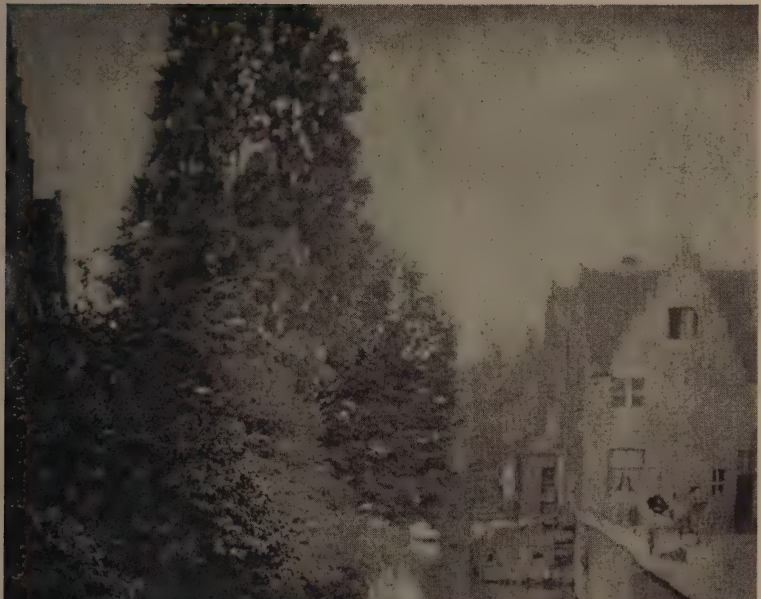
Before starting work, I level a sheet of glass of generous dimensions, and place the wet bromide on it, face up. While the tissue is soaking, I pour water on this print so that an unbroken sheet of water will stand on the print, hence the need of careful leveling. When the three minutes are up, I take the tissue from the "A" bath, drain for few seconds, and immerse it in the "B" bath. This controls the contrast. An immersion of about fifteen seconds will reproduce truthfully the gradations of the bromide print. A longer immersion tends to reduce contrast, so that it is actually possible to produce a flat carbro print from an extremely contrasty bromide. Conversely, the contrast present in the bromide can be considerably accentuated by cutting this immersion down, but too short an immersion, or its omission altogether, will very likely result in detailless high lights, as the gelatine washes off too readily in the developing water, regardless of its temperature. After the immersion in bath "B" is complete, the tissue is removed, drained briefly and placed in contact with bromide print on the sheet of glass. As the chemical action sets in immediately the contact should be made quickly, care being taken not to slide the tissue around on the bromide print, as this may result in a double image. It is at this point, that the sheet of water on the print proves useful, as it retards the chemical action just long enough to place the tissue in the proper position on the print. As soon as this is accomplished, I take a *flat* squeegee and squeeze the two sheets into contact, placing thumb and one or two fingers of the left hand on the edge of print and tissue to hold them together, drawing the squeegee away from that hand, in one sweep over the print. After that, use it in several directions, to make sure of contact all over.

The above represents the only difficulties, if one can call them such, that the process presents. The balance of the proceedings I will just touch briefly. The print and tissue are now picked up from the glass together and placed for twenty minutes (or a little longer) between damp blotters, covering them with a light weight. A few books, or a heavy sheet of glass, should suffice. Pressure here is not essential. In the meantime I soak a sheet of single transfer paper in tepid water to soften its gelatine coating, and place it face up on a sheet of glass. The print and tissue are now stripped apart, which owing to the damp blotters should be fairly easy, the print dropped into a pan of water, the tissue placed face down on the transfer paper, and squeegeed into contact. Tissue and transfer paper are now placed between dry blotters and weighted down for twenty minutes or somewhat longer. Weight here is useful, as it keeps the contact effective.

Meanwhile the bromide print, which has been bleached by the chemical action, can be washed free of the bichromate stain and re-developed with any developer on hand (minus bromide). No fixing is required, and after a short wash the print can be hung up to dry, and is ready to be used for future carbros. After twenty minutes being over, the tissue and transfer paper are immersed in a pan with warm water, and developed just like any other carbon print, this procedure being too well known to require a detailed description. The temperature of the water should be much lower than in the original carbon process. It is well to start with 92 degrees F. and to increase it very gradually only in case of need. which will not be often, except in a cold room in winter.

In high temperature it will be next to impossible to strip the bromide from the tissue, as the softened gelatine will tear and ruin the print. Aside from the precaution of using well cooled solutions, there is another way to overcome this. Do not try to strip the components apart, but immerse them in a dish with very cold water. After this has hardened the gelatine somewhat by chilling, it will be found easy enough to separate them *under water,* if they do not drop apart without actual assistance. Once you have the tissue on the transfer paper, this danger is largely over.

In addition to using any variety of transfer paper, commercial or home-made, to vary the surface effect, prints can be transferred to metal, ground opal glass, wood, ivory and a number of other supports. Materials other than paper should



OLD CANAL SCENE, BRUGES, BELGIUM MYERS R. JONES.
(*Platinum*)

not be gelatine coated, however, but treated with the following substratum: The white of one egg (or synthetic albumen) and 8 ounces of water.

Stir this vigorously, then add a few drops of strong ammonia. Strain the bubbles out through a piece of muslin and apply with a brush. It seems advisable to bake glass coated in this way for a short time in a moderately heated oven.

Further interesting effects can be obtained by not stripping the tissue at all, but putting it between dry blotters instead of damp ones. The bromide print then becomes the transfer paper, the silver image having been bleached away by the ferricyanide bromide action of the "A" solution. The color of the resulting carbro can then be modified by either complete, or partial, redevelopment of the silver image under the carbro. One can use the regular developer to bring back the silver image, or sulphide it with a solution of sodium *sulphide*. The latter acts very rapidly. If complete redevelopment is desired, the carbro print need not be dried before the redeveloper is applied. Parts of the carbro can also be treated at a later time, by brush application of the agents. For this, of course, it is necessary to first dry the carbro as its surface in the original wet condition will not stand any brush action.

The paper used in the process should be bromide, the make being immaterial. I prefer P. M. C. No. 2, as it is thin (makes good and easy contact) and seems to possess a longer scale of gradation than some of the other papers. However, heavy papers will also work, if carefully squeegeed. Especially does this apply to the non-strip manipulation. I have even used extremely rough papers, like Barnet's Tiger Tongue, or Wellington's Cream Crayon Extra Rough, with good success.

My working formulae are as follows:

Carbro Process

Sensitizer (A) Stock Solution:

Potassium bichromate	1 oz.
Potassium ferricyanide	1 oz.
Potassium bromide	1 oz.
Hot water	20 oz.

For use take: 1 part stock
3 parts water

CHIEF SPOTTED-TAIL. JOHN HOWARD PAINE.

I convert the whole 20 oz. stock into 80 oz. working solution which has practically indefinite keeping qualities, if kept in a brown bottle.

Graduator (B) Stock:

Formaldehyde (ordinary, 40 per cent)	5½ oz.
Hydrochloric acid c.p.	¼ oz.
Glacial acetic acid c.p.	¼ oz.

For use take: 1 oz. stock
32 oz. water

Throw away after use, not worth keeping.

Coating formula for transfer paper:

Gelatine	½ oz.
Water (cool)	10 oz.

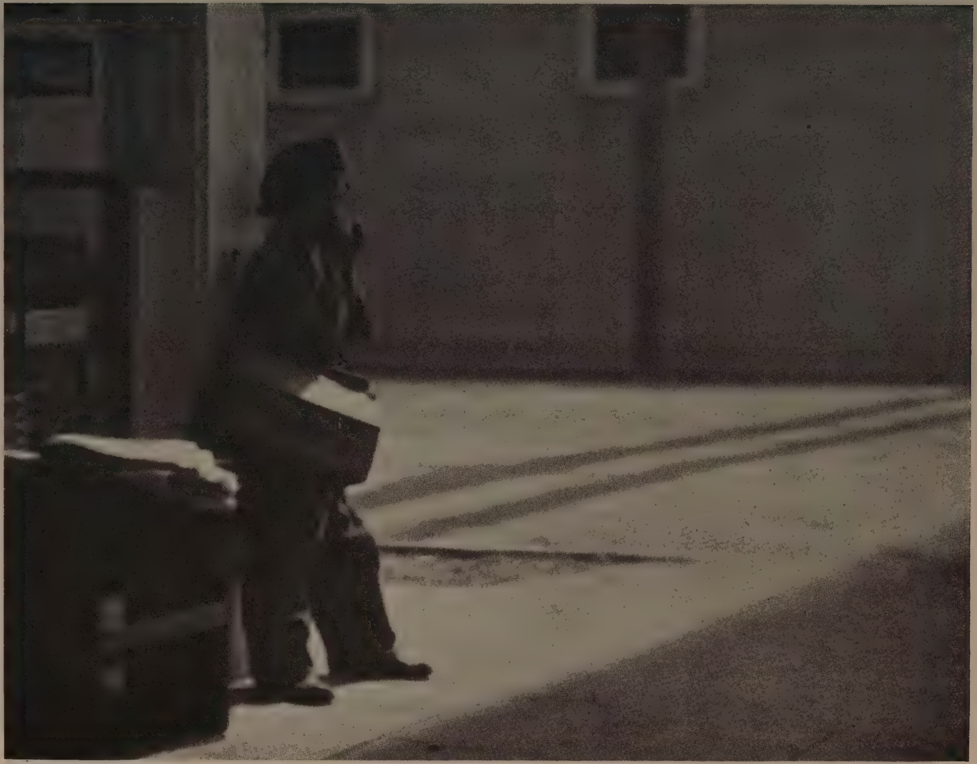
Swell gelatine in the water until soft, then dissolve by heating, but *do not boil.*

Previously to this prepare the following solution:

Water	8 oz.
Chrome alum	60 grains

and when the gelatine is dissolved add ½ oz. of this solution *slowly* to the gelatine. Apply two coats with a sponge.

I will have accomplished my purpose if the above remarks should tend to reduce the present reluctance of my fellow workers in using the process, which owing to its flexibility, and the wide range of colors available, has always had a great attraction for me.



LEISURE TIME. K. OTA.

PHOTOGRAPHIC OPPORTUNITIES ALONG THE COAST

By WILLIAM S. DAVIS

READERS of the *Annual* who live on, or very near, the seashore are doubtless aware of the opportunities their surroundings afford for the use of the camera. Many more readers, however, spend only their vacations on the coast and, in consequence have not the chances of becoming as intimately acquainted with the possibilities of their temporary surroundings, nor with the technique of photographing shore and water-scenes. A few suggestions may, therefore, prove of value to these readers when dealing with this type of material.

First of all, make sure the camera is light-tight, as a minute crack or a "pinhole" around the back, front or bellows can make a lot of trouble when one is working in strong sunshine. If the instrument takes plates or film-pack the holders should be examined; particularly the light-traps which are supposed to close the slots at the end when the slides are pulled out. Even with an equipment in perfect condition, however, it is advisable to throw a focusing-cloth over the camera while pulling out or replacing a slide, and it is not a bad idea to keep the cloth wrapped around the camera when waiting to make the exposure.

Don't neglect to provide a shade or hood to protect the lens from the glare of light reflected from all quarters outside the actual field of view. Such extraneous light when allowed to fall upon the front surface of the lens is a frequent cause of flat, foggy looking negatives. Then, too, a lens-shade helps protect the lens from flying spray on a windy day.

Film in all its forms—roll, pack and single cut sheets—is well adapted to the work, but the unexposed stock should be kept in as dry a place as possible—preferably in sealed tins if not used soon after being purchased—and development of the exposed material should not be too long postponed, for experience indicates that once undeveloped films have been subjected to the action of the humid summer atmosphere commonly encoun-

BREEZY WEATHER.

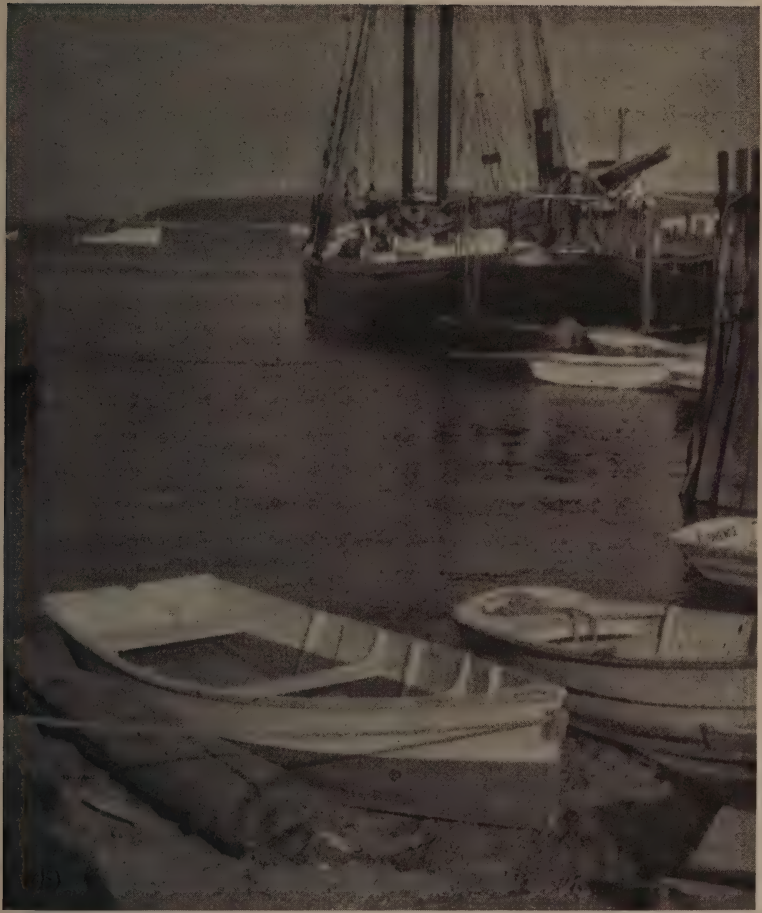
Illustrating article "Photographic Opportunities Along the Coast," by Wm. S. Davis tered along the coast they deteriorate more rapidly than do glass dryplates. For this reason it is safest to proceed with development within a week or two after exposing a batch; a matter that can be attended to readily enough almost anywhere by means of a tank and packets of developer and fixer.

If plates are used, choose a good brand of either the double-coated, or backed varieties of ortho. These will record most perfectly a very long scale of contrasts, and allow the user the maximum possible latitude in the timing of the exposure. Exposed plates, when not developed immediately, should be repacked in the original wrappings *face to face* without separators of any kind, and filled boxes sealed with adhesive tape.

A light yellow ray-filter is sometimes of great value when a slow snap-shot or time exposure is allowable. The object of using such a filter is, of course, to reduce the action upon the film of the over-active blue and violet light-rays, thus obtaining a truer, and generally a more harmonious, monochrome tone rendering of the various colors present in the scene. The value of a filter in this respect is especially noticeable when the charm of a scene rests to a great extent upon the tonal differentiation between white, or very light tints, and the delicate blues seen in the sky or water on a quiet day. A ray-filter is likewise an aid in bringing strong contrasts under control, as for example a coast-scene in which a dark rocky foreground comes in juxtaposition with a brilliant sky.

Most shore-scenes, as well as those from which the land is excluded, require considerably less exposure than does an average summer landscape under the same weather conditions, yet it is by no means impossible to undertime marine subjects, and thereby get harsh photographs quite devoid of atmospheric quality. Open sea and sky, and distant shipping, require on the average about one-eighth the timing as does an average landscape with foliage, while shore-scapes, and well lighted bits around wharves, should be given approximately one-quarter as much as the type of landscape mentioned. In estimating the proper exposure to allow one should be governed, however, by the extent and depth of the darker tones that are present. The greater the contrast the longer the exposure that is needed to secure shadow detail and good tonal gradation.

When moving shipping is included one must, of course, give a thought to the shutter-speed necessary to "stop motion." In



SNUG IN PORT.

Illustrating article "Photographic Opportunities Along the Coast," by Wm. S. Davis.

the case of fairly distant craft, 1/25 second will ordinarily be quite brief enough to avoid blurring when the cameraist is working from a stationary viewpoint. If the exposure is made from another craft in motion this factor must also be considered, especially if the vessel is a steam or motor-boat, since vibration as well as ordinary movement adds to the chances of getting a blurred image. Under these conditions, from 1/50 to 1/100 second is the slowest timing that it is reasonably safe to give, and the camera should be held in the hands rather than rested against any part of the vessel one is on. As an aid in keeping the image centered I can recommend a direct-vision finder. This also possesses the advantage of enabling one to see easily what is going on outside the range of view, thus making it possible to anticipate to a great extent the action which is about to take place, whether the subject be a rapidly moving boat or a breaking wave.

Surf studies are best made at comparatively slow shutter-speeds, since absolutely sharp rendition of flying spray is not conducive to successful interpretation of visual effect. A timing of 1/25 second has proved the best under most conditions.

As a general thing the best distribution of light and shadow in marine scenes is found in the morning, and late afternoon, during the summer months. Side lighting is good as a standby, but some very striking and beautiful effects in cloud and water-scenes are often in evidence when one is facing toward the sun. However, to avoid light-struck negatives under the last named conditions the sun's disk (if included within the field of view) needs to be partly obscured by clouds or mist.

Great stretches of open shore and water, being very attractive to most people, prove tempting subjects, but are practically certain to be disappointing in photographs unless the interest is either concentrated upon some feature in the foreground, or there is present a beautiful cloud-effect which can be made the culminating point of the composition.

Where much good material abounds there is always the temptation to include too much in a single picture. Whatever the type of subject, this tendency must be overcome before pictorially successful results can be secured, since strength and effectiveness lie in the direction of organized arrangement of only such material as is needful to fix attention upon, and balance, a pre-determined feature.

YACHTING WEATHER.

Illustrating article "Photographic Opportunities Along the Coast," by Wm. S. Davis.

SNAPSHOOTERS, BEGINNERS, AMATEURS AND PICTORIALISTS

By A. H. BEARDSLEY

WHATEVER may be said about the merits or demerits of class-distinction, the fact remains that something of the kind has crept into photography and will, in all probability, remain there for some time to come. It is too early to make very definite statements; but perhaps a consideration of these four groups into which camera-users are being placed will be of interest and lead to beneficial developments later on.

In the photographic magazines we meet the word "snapshooter" or "snapshotter" with increasing frequency. In some cases this individual is frowned upon as some one or something to be avoided. In other quarters he is offered special inducements, and is made to feel that he is a very respectable person after all. There is justification of both points of view. If the snapshooter is one who makes no attempt to master his camera, wastes plates and films, litters up our beauty-spots with paper-cartons, and finally has nothing to show other than out-of-focus, under-exposed and poorly composed pictures, then he deserves to be condemned.

However, if he is in the process of photographic evolution and his "messing about" is due simply to his eagerness to learn and to improve his work, then we can be patient and we will do well to extend a helping hand. Many who read these lines will agree, I believe, when I say that amateur and professional photographers, the world over, should constitute themselves an aggressive force to stop the throwing about of roll-film cartons, filmpack-tabs, and plate-boxes near places of historical or scenic interest. I mention this matter here because justice compels me to say that it is not always the snapshooter who is the guilty one; yet, he is often accused of it.

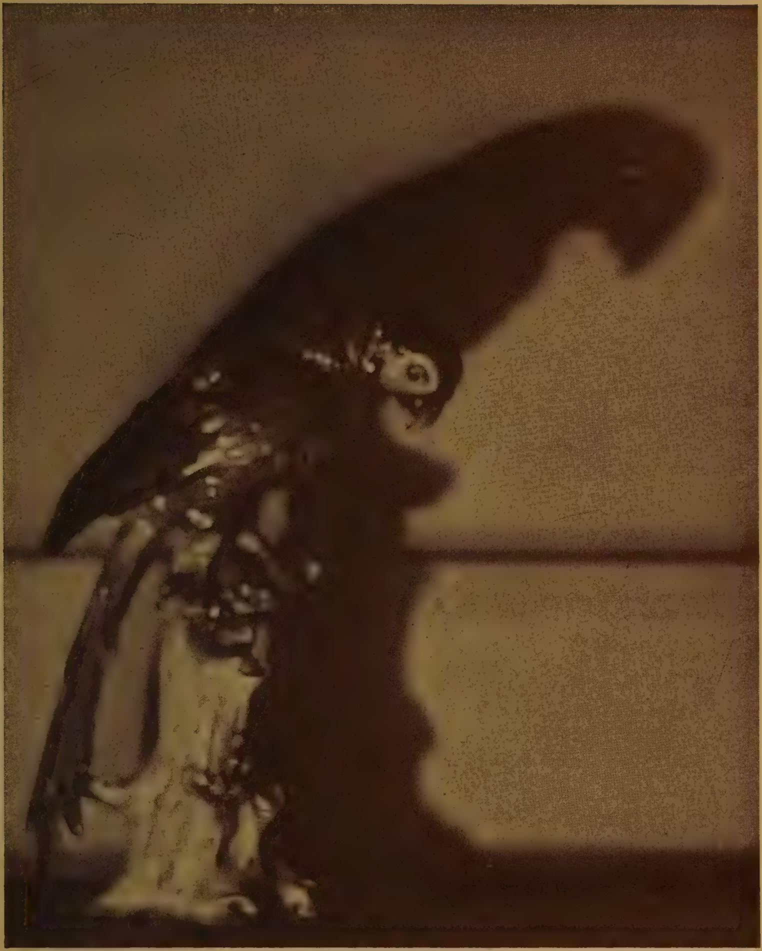
Whatever our opinion may be of the snapshooter and his merits or demerits, let us give him the benefit of the doubt.

THE CITY IN WINTER. P. F. SQUIER.

In particular cases where he brings discredit upon the good name of photography, let us endeavor to show him the error of his ways, and to do this in such a diplomatic manner that we shall win him to good photography rather than drive him out of it altogether. Moreover, how many of us can "cast the first stone?" Did not quite a few of us begin in the snapshooter class? Did we not "mess things up" and produce wretched looking pictures? Were we not laughed at and criticized, and even condemned for "dabbling" in photography? In view of these facts can we deal very harshly with the present-day snapshooters?

Right here, some reader may remind me that I have rather consistently urged owners of cameras not to be snapshooters. True, and I still stand upon the same platform. With all due allowances for the snapshooter and with no desire to offend him, I do believe that my readers will make better pictures just as soon as they get out of the snapshooter class, and really understand what is meant by an amateur photographer. Let snapshooting be a step to something better, not the goal. We must creep before we can walk; but who would like to creep through life. Hence, my suggestion is to get into and out of the snapshooter class just as quickly as time and resources will permit. There are so many better things ahead photographically and otherwise.

Well, what is a beginner in photography? There was a time when this term was virtually equivalent to snapshooter in meaning; but during the past few years I believe that it refers to the first real step ahead in photography. Usually, when a man begins something it is his intention to attain a certain objective. In a sense, to admit that he is a beginner is a public announcement that he is trying to reach a definite goal by means of practice, study and personal initiative. I believe that a beginner in tennis, golf, shooting, yacht-racing or automobile-driving does not feel that he belittles himself by admitting that he is a beginner. To be sure, there are times when to be a beginner in any activity is not so pleasant as to be accepted as an expert; but then what expert is there today who did not have to begin? Hence, in photography I believe that the beginner should merit respect; and that instead of seeking opportunities to make fun of his untrained efforts, we should make him feel that whatever we may know we shall



THE PORCELAIN PARROT. G. W. Harting.

be glad to share with him so that he may soon qualify as an amateur photographer.

It may not be amiss to call attention to the vital importance of the beginner to every camera club or photographic society. Where, pray, will some clubs be in another ten or fifteen years, unless their ranks are recruited from among the beginners in photography? How about the new members who have joined a camera club and, perhaps, cannot fill a plateholder or develop a plate? Are these beginners to be let alone, ignored or made fun of by the so-called experts and salon-exhibitors? Mind you, I am pointing at no one, I am merely asking the question. If it touches a tender spot, it may serve to encourage more beginners to join a good camera club.

No man likes to be belittled, or be made to feel that he is in the same position as a little child at a dinner-table who is told that "little boys should be seen and not heard." Even with the most cordial welcome by members of a camera club, the beginner feels a bit out of place until he can reach a common ground of photographic knowledge. It is all new and strange to him. His own little developing-and-printing outfit at home has not prepared him to use the larger and more elaborate equipment of a camera club. It is not particularly easy for him to step right into the enlarging-room and make a 11 x 14 print with a Cooper Hewitt M-tube when his previous efforts were confined to a daylight Brownie enlarger. In short, our beginner has enough to think about without the additional problem of having to face being ignored by older and more experienced club-members.

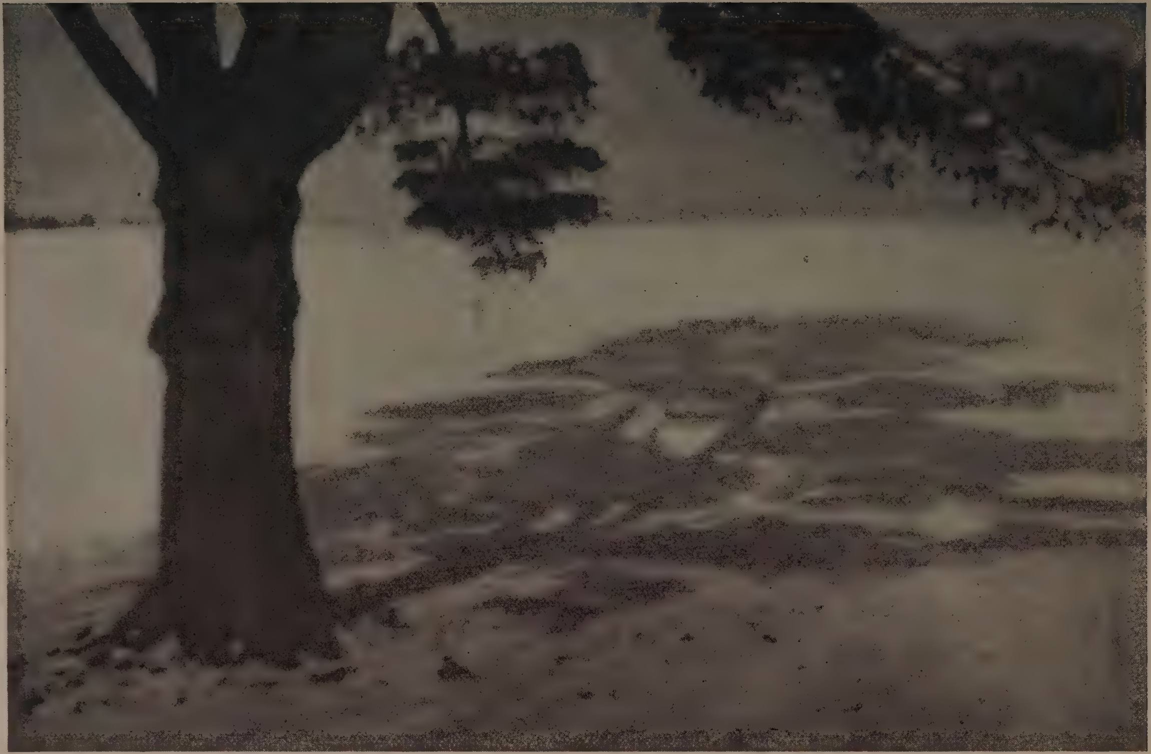
By all means, let us recognize the ability and success of the workers who have won and are winning laurels at salons and exhibitions. Their efforts and hard work are being rewarded, and no one denies them the credit which is their due. However, when all is said and done, the future growth of photography rests squarely upon the beginner of today. Whatever we do now to encourage, train and recognize the beginner is constructive. Whatever we do that may discourage, hurt or offend the beginner is positively destructive. Therefore, let me urge that individuals, as well as camera-club members, recognize the beginner in photography as a vital factor and one which cannot be overlooked or ignored without affecting the future of camera-clubs and photography.

What has happened when the beginner becomes an amateur photographer? Is there really a difference? Certainly there is a difference. Does not the inexperienced owner of a new automobile drive better at the end of several months' motoring than he does when he first takes the wheel after getting his license? To be sure, he may drive well, considering his inexperience, and he may do all that is required to conform to the rules of the road; but there is not the confidence, the ease nor the pleasure of driving which will come with greater experience.

So it is with the beginner and his growth to the title of amateur photographer. In a sense, he is qualified to do work which is equivalent to that produced by a professional. The difference being that one accept prizes, medals, ribbons and awards, and the other accepts fees for his work. Many an owner of a private car is a better driver than some chauffeurs who expect a good weekly salary for their services. Even so, there are many amateur photographers who do work which is superior to that of some professional photographers who charge a high rate for their services.

There is another point with regard to the amateur photographer. Usually there is a real love of the work behind every effort made; and, for this reason, the pictures have a quality about them which the beginner cannot match. Moreover, the amateur photographer has learned to use his photographic equipment to advantage. Barring exceptional conditions, he can make a picture whenever he wishes and, usually, obtains satisfactory results. His is that confidence which the beginner has yet to attain.

Then, too, the amateur photographer has learned to be tactful and diplomatic in the matter of making pictures on private property, or wherever permission should first be obtained; he does not leave paper-cartons and film-pack tabs lying about; neither does he help himself to flowers, shrubs or carve his name on trees, benches and summer-houses. Such conduct marks the amateur photographer; and, when lived up to, wins for him the respect and good will of the general public. In short, the true amateur photographer is first a gentleman, then a good technician and artist. He may match the skill of the professional; but he prefers to remain an amateur, and to work in photography for the love of it.

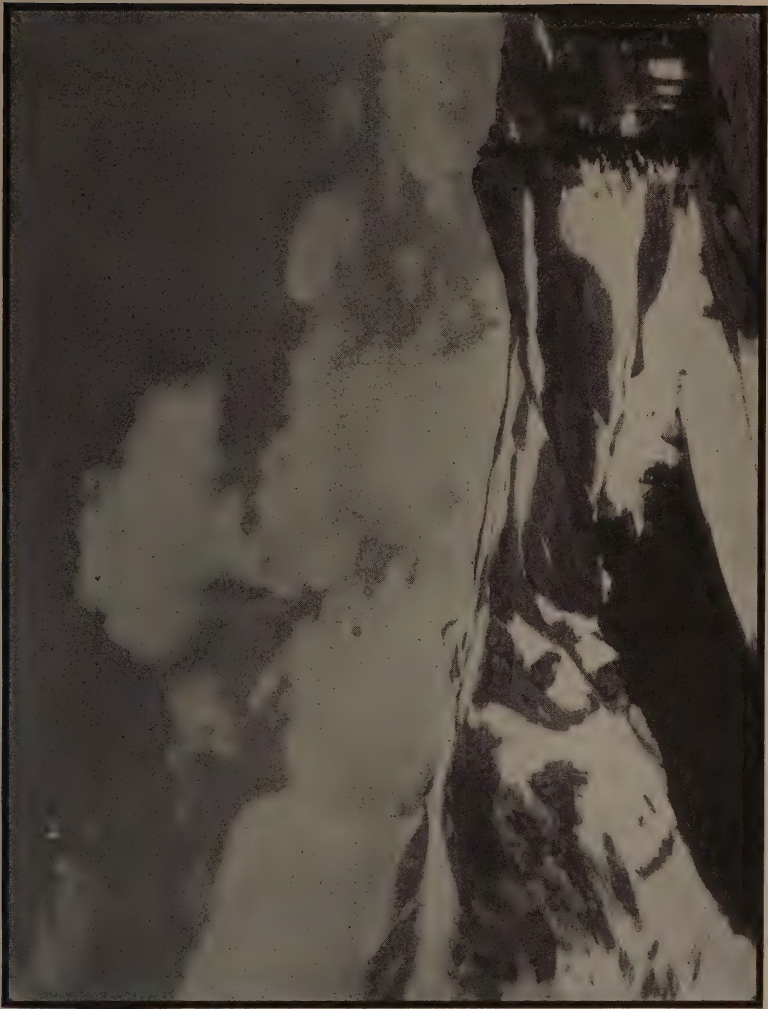


THE SHADOW OF THE PINE. ALBERT WILLIAMS, JR.

The fourth member of our photographic classes is the pictorialist. He is the one who is working diligently to put art into photography. He has progressed from snapshooter to amateur photographer, as all do who are sincerely interested in photography. However, although he might well become a professional, circumstances do not compel him to adopt this means to earn a livelihood; he, therefore, finds his opportunity for further expansion in photography by joining the ranks of the pictorialists. With all due respect, sometimes, the pictorialists give us a form of art in photography which, to say the least, requires considerable study to understand and to enjoy. In most cases they produce work which is indeed beautiful and artistic—work that needs no one to explain it for the benefit of the beholder.

Often, some pictorialists are stirred by an urge to do something out of the ordinary and they go ahead. The results are wonderful to those who may be sufficiently "educated" to appreciate the "art-values"; but the average well-trained and intelligent pictorialists bear in mind that the subjects of greatest beauty and appeal are those which are simple, true and without any straining after an effect. We owe much to the pictorialists; for in them we have a splendid body of earnest men and women who are sincerely eager to have photography assume its rightful place in the realm of art. It is among these men and women that we find those who contribute the best in pictorial photography to the leading salons of the world. We may not approve their work always; but we cannot doubt their sincerity, nor their value to the art and science of photography.

In this article no attempt has been made to go into the subject deeply, nor should any of the statements made be taken as final. Changes are occurring almost daily, and it is hardly the proper time to speak too positively of the trend of things in the future. However, it does seem to me that the four classes of snapshooter, beginner, amateur and pictorialist are becoming clearly defined, and that each is doing much to make photography appeal to the general public. In fact, we now have a place in photography for everyone. No matter how little, or how much, a person may know of photography, there is a definite position which he can occupy



S. TADA.

and from which he can graduate whenever time and inclination permit.

I am not so sure that having these four classes does not act as an incentive to those who may begin at the bottom. Certainly a freshman does not wish to remain a freshman during his four-year college course, neither should a snapshooter fail to make progress as rapidly as possible, and thus merit a higher rank than snapshooter. There ought to be an unconscious desire to go ahead, to make the most of photography; and I believe that the four classes mentioned will serve to keep up interest and to encourage many to take up the camera. In any event, a little of the spirit of competition and rivalry, if it is kept good natured and friendly, will do no harm. Until things shape themselves more definitely, let us try out these four classes in photography, use the terms, see that the proper rank is given to every camera-user, and do our very best to keep good photography before the general public.

THE FANE. HAROLD W. COLE.

AFTERGLOW, SICILY.

ALEX. KEIGHLEY, F.R.P.S.

THE OIL PROCESS

By FRED T. USHER

OF all the control processes which have done so much to advance the pictorial application of photography in recent years, the Oil Process undoubtedly stands in a class by itself.

True, the Bromoil Process has overshadowed it somewhat in popularity, but this state of affairs is due not to any superiority from the artistic or technical point of view. The bromoil print is made from a contact bromide print, or from an enlargement on similar paper, and the cost is comparatively small. On the other hand, the oil print is usually made from a contact print on plain gelatine sensitized in a solution of a bichromate salt.

An impressive print of, say 12 x 10 inches, is made from a negative of that dimension, and plates of such measurements cost a good deal of money. But for this hard fact it is fairly safe to assert that the Oil Process would equal any other known process in popularity.

Notwithstanding the cost of the large negative the Oil Process is well worth while. The results, when produced by a master-hand, are magnificent. There is no word which so adequately expresses the quality of a good oil print. For depth, richness, and for luminosity of shadow detail what pictorial medium can rival it?

From the purely technical point of view there is also much to recommend it. In its case pigmenting is so easy, and so certain, that any intelligent novice could ink up at the first attempt. Indeed it is so easy, if we consider only the act of inking up, that as a bromoil worker I would not hesitate to advise a novice to master the Oil Process before attempting to adopt the more complicated procedure demanded by the Bromoil Process.

The aim of the bromoil worker is, or should be, to coax his bleached bromide print into the condition in which the oil print develops almost of its own accord. No one can, as

CHERRY TREE. Junzaburo Mori.

a matter of fact, fully appreciate the delights of pigmenting if he has not worked on an oil print.

The large negative can, of course, be made in the ordinary way in a big camera, or it may be made by enlargement from a small negative on to glass, film or paper which may be made translucent to facilitate printing. The glass negative is best for many reasons. A positive is first made from the original negative on a lantern, or process plate. This positive is placed in the enlarging machine and the image cast upon the large plate which, when developed, gives a negative of any quality, or density, that may be desired. In the case of the oil print a rather plucky negative is to be preferred.

If a negative of super-quality be required special attention must be paid to the making of the positive. This ought not to be plucky. Plenty of exposure should be allowed, and there should be no clear glass such as one sees in a lantern slide. There must be detail everywhere and not too much density. The best positives are undoubtedly made from the special carbon tissue manufactured for that purpose. By this means it is possible to obtain perfect gradation of tones, and to preserve the minutest detail contained in the original negative.

Having made the large negative the preparation of the print for pigmenting is a very simple matter. Either ordinary double transfer paper, as used in the carbon process, or, better still, the gelatined paper made specially for oil workers by the Autotype Company can be chosen.

This paper must be sensitized and dried. A prepared spirit solution can be bought. It is spread upon the paper according to directions, and dried in the dark for a quarter of an hour. In the absence of the spirit sensitizer a solution of potassium bichromate in the proportion of one ounce of the salt to 25 ounces of water with a few drops of ammonia added can be made up. In this solution the paper is soaked until limp, or, better still, for exactly three minutes, and dried in the dark, which takes some time.

In its dry state the paper is placed behind the negative as one would print P.O.P. until a fairly strong image showing faint detail in the high lights has been obtained. Daylight is necessary for the printing. When the exposure is complete the paper is removed from the printing frame and placed in cold water with frequent changes until the yellow stain of the bichromate has disappeared. By this time the gelatine will have swollen so that the image may be seen in slight relief.

If the washing water is very cold the final change should be made in water slightly warmer, but be careful not to overdo it. The print is now laid on a wet pad, as in the bromoil process, and inked up in the usual way, using hard ink first and gradually softening the consistency of it until the gelatine takes it easily. It is necessary to get a bromoil print into this amiable condition before inking—not always an easy matter. The oil print seems to get into condition naturally, which is a great advantage when the novice wants to try a prentice hand at inking up.

We are likely, I think, to hear more in the future about the application of the Carbro process to the making of large oil prints. By this means it is possible to transfer the image from the bromide enlargement to the gelatine coated paper and ink up without the use of the large negative. There seem to be great possibilities here.

It would be unsatisfactory to close this article without a reference to the Oil Transfer Process. The oil transfer, when properly made by one with true artistic instinct, is one of the finest products known to photography, and the fact that soft inks can usually be handled with comparative ease, makes the operation of transfer fairly simple.

The press difficulty has been admirably solved by the new transfer press just placed on the market by the Autotype Company.

THE ROMAN CAUSEWAY, ST. ALBANS. FRED T. USHER.
(*Bromoil Transfer*)

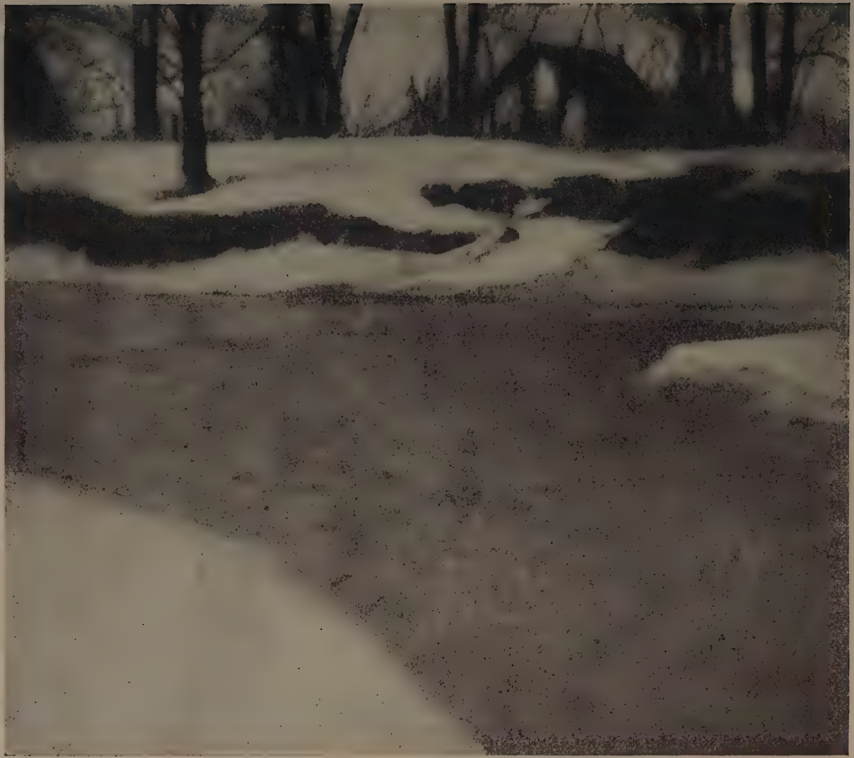
VALUES

By PAUL L. ANDERSON

THE term "value," as used by artists, refers to the amount of light reflected from any particular object, or, in the case of a self-luminous body, emanating from it. Light values are related to color only indirectly—as will be discussed later—and may therefore be translated readily into monochrome, this fact rendering them of especial, even vital, importance to the photographer. Indeed, many camera workers fail utterly to realize the imperative need for a careful study of values, their work falling short, for this reason, of its highest possibilities, and it is the hope that this present discussion may stimulate some camera users to a more complete and thorough study of this highly important and interesting matter.

It is not the writer's purpose to discuss values within the picture, that is the interrelation which is most pleasing on canvas or paper. This is too broad a subject for an article of this kind, requiring long study of art and meriting an entire volume to itself. But some suggestions as regards values in nature, and their proper rendering in a photographic print, may be helpful and, it is hoped, productive of that clearer vision, which is the first requirement of the artist no matter in what medium he works.

In only a limited number of cases is it possible to reproduce in the print the exact values of any subject, whether we work in photography or in any other form of art. The sun, the brightest object in nature, is many million times as high in value as the paper or canvas on which our picture is made, and the lowest limit of value possible in a print is far higher than the blackness of a dark night. Indeed, the darkest shadow in a landscape may—and probably will—be much lighter than the blank paper which forms the foundation of our picture, since the photograph is almost always examined indoors, and often by artificial light. The pupil of the eye expands to



WINTER LANDSCAPE. EDWIN F. CASPER.

accommodate itself to weaker illuminations, so we are not sensible of the relative faintness of our indoor light, but should we test the reflected light from our print by means of a photometer, we would be astonished to find how weak it actually is as compared to the illumination which exists outdoors.

Since we cannot reproduce the values of the chosen subject with anything even remotely approaching truth, it becomes necessary to consider how a seemingly truthful representation may be given, and we find that custom and imagination fortunately work together to help out the artist. We are accustomed from infancy to look at pictures, and come to recognize certain symbols as meaning certain things. Show a picture of any natural object, no matter what, to an untrained savage, and he will see in it only an arbitrary arrangement of black and white; it will not even suggest to him the object represented, for he is totally unfamiliar with the set of symbols which have come to mean so much to us.

Sculpture can show things as they are, and it is probably for this reason that the earliest art efforts of the primitive peoples take the glyptic rather than the graphic form, but a picture, however, perfect it may be, can do no more than suggest to us things with which we are familiar, and it may be mentioned, in passing, that herein lies the reason for the failure of the Cubist and Futurist schools; they do not suggest anything with which we are acquainted. In Japanese and Chinese art truth to values means comparatively little; the Oriental artist uses a different set of symbols from the Occidental, and he reaches his goal, the stimulating of memory and imagination, by a different path. But to us, with our training, values mean much, and it becomes necessary to adjust them in such a manner as to achieve the mental stimulus without which a picture fails.

We have found that we cannot reproduce actual values, but fortunately it is possible to reproduce relative values, and if this is successfully accomplished the mental stimulation may be great. Look at some subject—a landscape, for instance—and for the time being ignore the color. It will help us to see the subject in monochrome if we half close the eyes and look through the lashes, or, better yet, look through a rather deep ray-filter. (Incidentally, this is one of the reasons why

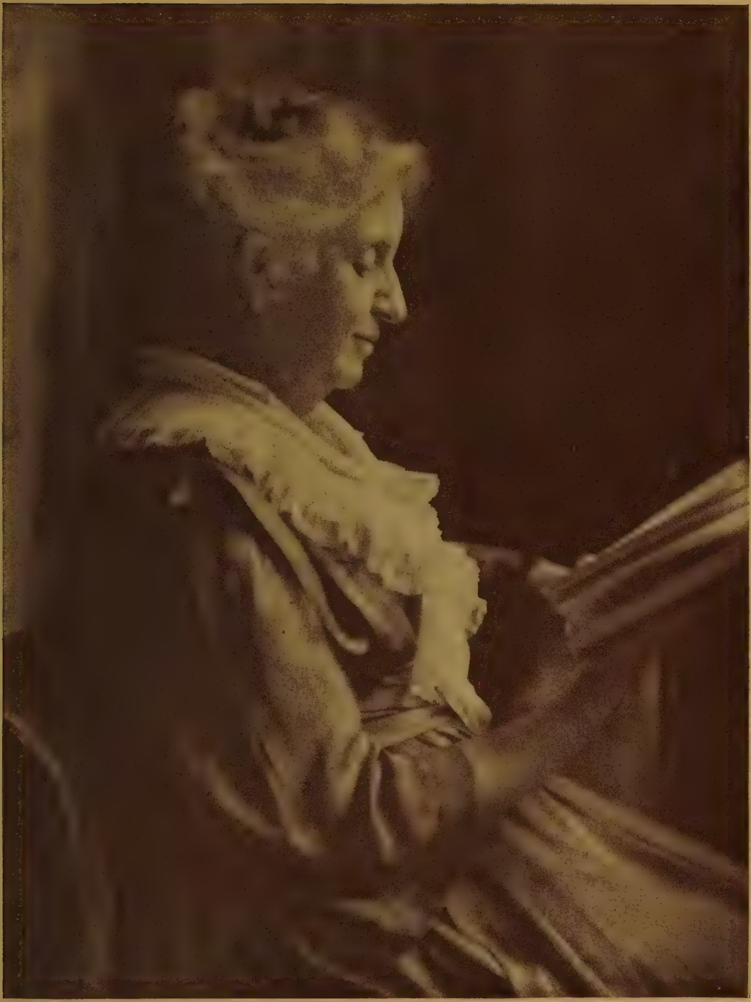
WHITE WALL.

M. HIRAI.

pictorial photographers are advised always to do their composing and focussing with the filter in place on the lens.) It will be found that the brightest portion of the subject—probably the sky—and the darkest part are separated by a wide range of values, other objects, such as trees, houses, and figures, assuming definite places in the scale. For example, the view from the writer's window shows grass, sky, several maple trees, several beech trees, and a white house. The sky is by far the brightest part of the scene; the house, considerably lower in key, comes next; then the lighter portions of the maple foliage; then, very nearly the same, the grass; next, the darker parts of the maple foliage; then the lighter parts of the beech; then the maple trunks; following those, the dark portions of the beech foliage; and last of all the shaded trunks of the beeches. Now, if we photograph this subject in such a manner that these various objects assume, in the print, the same *relative* values that they have in nature, the suggestion to anyone examining the picture will be very powerful; he will recognize at once what is represented.

And this will be true even though we do not exhaust the limitations of our printing paper. We might show the sky as blank paper, and the deepest dark of the beeches as a light gray; we might make the darkest part of the beeches black and the sky a gray below the middle tone; or we might compress the whole into the middle range of the print scale; by making these variations we would suggest different times of day or different qualities of light, but so long as the relative values were correct, so long as their interrelation was kept the same as in nature, the suggestive effect would be maintained in full power. This, then, is what the photographer must in general do. He must arrange his subject so that the interplay of values in the picture will be pleasing to the spectator's eye, and he must then reproduce these values in their true relative quality, ignoring the actual luminosity of the objects which he shows.

Translated into technical terms, this means a non-halation—preferably double-coated—panchromatic plate; a fully correcting filter; full exposure, so that all portions of the subject may fall, in the negative, within the straight part of the Hurter and Driffield scale; development adjusted to the printing paper which will be used and to the effect desired; and correct



SERENITY. Dorothy Jarvis.

printing. This seems like a formidable list of requirements, but a little experience will reduce it to a mathematical formula which may be carried out with almost absolute precision, leaving the worker free to concentrate on the artistic aspects of his subject. After all, pure photography is a mechanical art, and the technical portions of camera expression are simply machine work. Incidentally, it may be said that for practically all landscape work an orthochromatic plate is quite as good as a panchromatic; the latter shows its greater worth in portraiture.

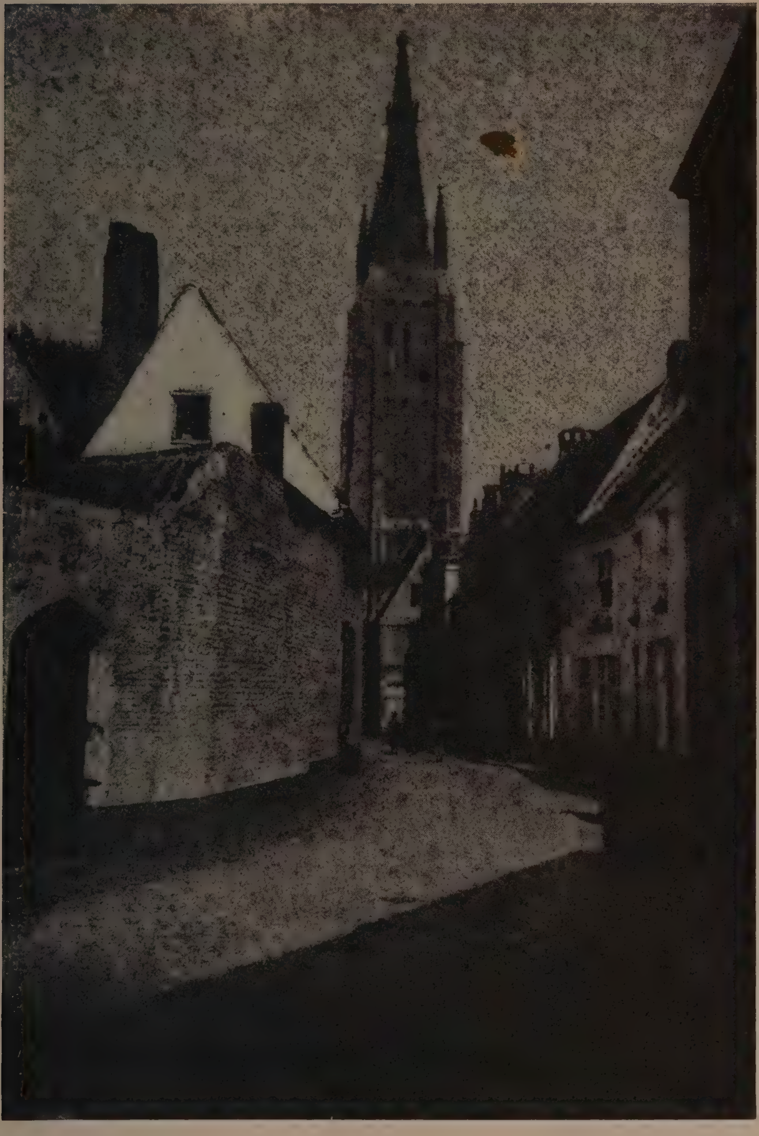
We have spoken of the variations in effect possible through choosing different scales, and this merits a slightly extended consideration. Suppose, for example, we elect to render the landscape already referred to in a high key, that is, to make the deepest dark a light gray and the highest light pure white or nearly so. (For esthetic reasons it is seldom advisable to have absolutely blank paper in a photograph). The suggestion then, for both physiological and psychological reasons, will be of early morning; a high key in landscape almost always correlates itself with the early hours of the day.

Suppose we decide to have it in a low key, the sky being a medium gray and the darkest parts of the tree-trunks black. The suggestion then will be of evening. If we make the sky a dark gray and lose the deeper darks in a mass of black we will get an effect of moonlight, but in this case we must be careful to retain, by one means or another, an effect of luminosity in even the deepest darks; shadows in moonlight are black but they are not empty. Suppose we work in a medium key, making the sky considerably darker than white paper and the deepest shadows considerably lighter than our blackest dark of the printing medium. In this case the effect is non-committal; it might be almost any time of day, and the esthetic effect, the stimulus to the emotions, is negligible.

If we wish to produce special effects it sometimes becomes necessary to modify the relative values. We are not speaking now, of hand work, though it is the writer's firm conviction that photography can seldom take rank as a fine art without the intervention of the human hand. This, however, is too broad a subject for discussion here, and we will confine ourselves to the purely photographic aspects of the work. But by modifying the relative values through adjustment of exposure (the only way aside from multiple printing in which they can be modified without hand work) it is possible to make the resulting suggestion exceedingly strong. The writer has a print, given him by an English friend, which is printed in a medium key but in which the adjustment of relative values is so perfect that, despite the lightness of the print, the suggestion of moonlight is perfect. The shadows are empty but not black, the middle tones are thrown down toward the darks, and the lighter tones are well down in the scale; the impression is irresistible. This is an extreme case, and a technical triumph—a pictorial triumph, as well—but it shows that the possibilities of the camera are far beyond, and quite different from, what is generally believed by the public, and by workers who have not given long and careful thought to the subject of values.

It is necessary, also, to consider what values we wish to emphasize, for it may be that, pictorially, we will find it best in certain circumstances to ignore some things for the sake of esthetic or suggestive effect. An example—which the author has used before—is found in the case of a group of trees against a brightly lighted sky. If we look at the scene as a whole we shall, because of the accommodation of the pupil, see the gradations of light in the sky, while the trees appear a solid black mass. Shading the eyes with the hand, to exclude the direct light from the sky, we find details and gradation in the trees to leap out astonishingly, the branches and foliage assuming—apparently—a much higher value than before. Taking the hand away and looking quickly at the sky, we find this now appears much more brilliant than at first, perhaps even dazzlingly so. From this we see, first, that there is no such thing as a permanent, actual value, this depending in all cases on surrounding circumstances; and second, that we must so adjust our relative values as to lay the emphasis on that portion of the subject in which the interest lies.

Another illustration may be found in the case of distant hills, which if photographed in their true value may seem unduly near; in this instance the use of a filter which does not quite fully correct will set them back to a satisfactory distance. Sun-lit snow is one of the few subjects which insistently demand absolutely faithful rendering; here any deviation from correct relative values and a high key will



AN OLD STREET—BRUGES. J. HAROLD LEIGHTON.

lose the brilliance and sparkle which make the subject interesting, but most subjects prove themselves more amenable to the photographer's desire for emotional effect.

An interesting result which follows from correct adjustment of relative values is that when this result is accomplished the print carries a strong suggestion of color. We are accustomed to see color in nature, and so great is this habituation that when the relative values are exactly right, the observer thinks he sees actual color even in a monochrome print. The effect is, of course, purely imaginary, and vanishes on close and attentive inspection, but it is none the less present to the casual spectator.

One exception may be noted to the general rule that values, except for special effects, should be rendered correctly. This is in the case of objects having a yellow or red color, for these colors are psychologically lighter than they are photometrically. We are accustomed to associate them with brightness, they are what are called strong colors, and it is almost always profitable to render them a trifle higher in key than they would show themselves on actual measurement.

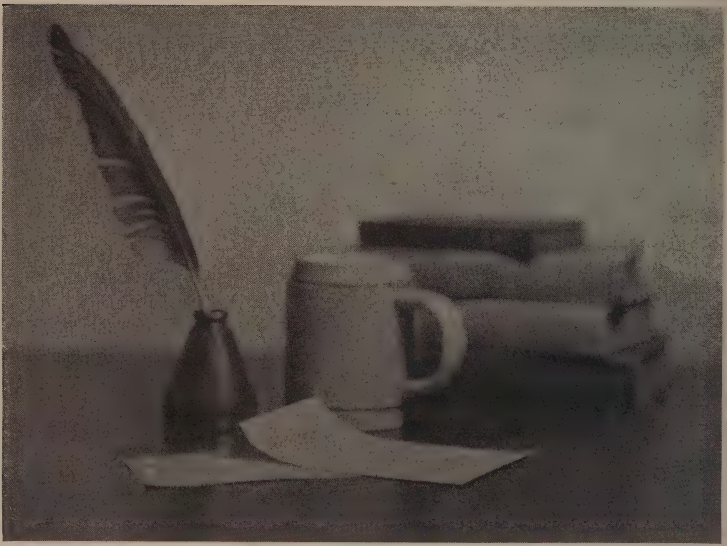
In portraiture there is a greater latitude permissible in the falsifying of values than is the case with landscape, for here we should subjugate everything else to the sitter's personality. Clothes may often be lost in shadow, surroundings should be suggested rather than seen, and only those values which are of importance in expressing the sitter's character are essential. It is often desirable to emphasize certain features at the expense of others, to modify the planes of the face, or to change the expression of the features by a falsification of values. This may be done by modifying the exposure, by multiple printing, or by hand work on either negative or print, though it is always best, if possible, to adjust the lighting of the subject so that straight photography will give the desired result, and hand work is almost always best reserved for garments and backgrounds.

It will be seen that the subject of values, which by reason of available space has been but lightly touched in this article, is one which will amply repay long and careful study; indeed, without such study the photographer can never hope to rise above mediocrity. One caution should, however, be given. The writer has seen many promising photographers become

STILL LIFE. I. LAQUAN NAKAYAMA.

so interested in values as to concentrate largely if not exclusively on this portion of the art, their work gradually deteriorating into a pure estheticism which, though beautiful, carried no message beyond that of abstract beauty.

Any art is a medium of expression, valuable only when it conveys an idea, and no picture, however fine, can hope to compete in sheer, soul-lifting beauty with the exquisite harmonies of life with which nature surrounds us. It is when we are most strongly reminded of nature that we are most impressed, and a picture which is merely beautiful will draw from a lover of art and of life only the indifferent comment: "That's rather nice." Beauty of line and of pattern and of value is no more than a tool, one with which we must be so familiar as to use it without conscious effort, but valuable only as it enables us to give expression to the lofty thoughts that must inevitably animate any work which is to carry a message, to help others to fuller and happier lives, and to endure for more than the passing day and hour.



STILL LIFE. CARL C. DISTLER.

NEW HAMPSHIRE LANDSCAPE. LOUIS WERNER, JR.

MOUNTING AND FRAMING AS A FINE ART

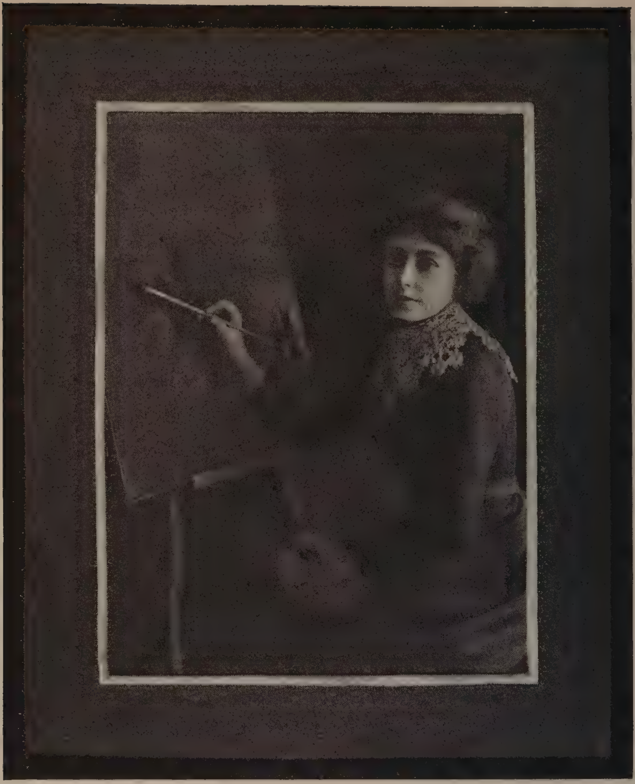
By A. LOCKETT

DOUBTLESS some readers will raise their brows, or their shoulders, at the above title. Both the modern painter and the pictorial photographer have been taught to consider the mount and frame as entirely subordinate to the picture, and of trifling consequence in themselves. But is that really so? Can surroundings of any kind whatever be without some artistic effect, whether beneficial or detrimental, to the thing surrounded? And is it not, therefore, more logically accurate to regard the frame, the mount, and even the nature of the room in which the picture is hung, as adding to, subtracting from, or perhaps subtly modifying in a neutral sense, the appeal and very character of the picture? The great artists of old evidently came to that conclusion, since they often designed their own frames to harmonize with the surroundings, and with the work itself, sometimes going so far as to paint, or at least finish, the latter in its destined place.

In fact, though it may seem a bold saying, a picture or print is subject to quite definite variation with different framing, lighting, housing, or companions. Even in an art gallery, where masterpieces hold the field, the result of removing a picture from one room to another, and introducing it to fresh neighbors may come as a startling shock to those who have become habituated to the former arrangement. In our own homes, too, how often is it noticed after a scheme of redecoration has been carried out that some of the previously admired pictures seem to have lost their old charm, while others, once less esteemed, appear to possess an added beauty. A mere matter of wall-paper, paint and curtains, then, has managed to insinuate itself intimately into the final effect of essentially artistic productions, and, for the time being, cannot be eliminated. Not only is it important how we frame the painting, but how we frame the frame.

The Road to the Dunes

Jr. 1925

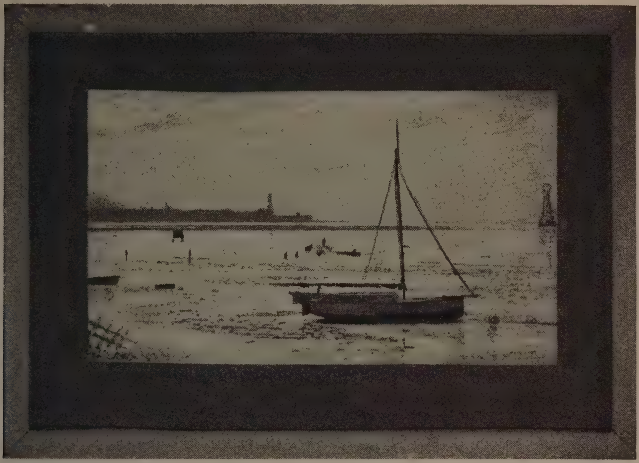


THE ARTIST.

Figure 1.

With photographs, which lack the luscious coloring and vigor of oil paintings, especial attention is all the more necessary to suitability, taste and effectiveness in mounting and framing. As in most artistic matters, there are no inflexible rules or canons, but each particular case must be treated on its merits, as a whole. Starting with exactly identical prints or enlargements from the same negative, it is quite possible for a dozen expert workers to obtain as many different schemes of framing alone, or of framing and mounting, all good and acceptable in their way, and each doing full justice to the photograph, but of widely diverse character as regards ultimate effect. To such an extent can a fine tact and artistry be displayed in these details, and so far are they from being merely extraneous or mechanical, that it is easily possible to make a poor print effective by cleverly judged mounting and framing, or what is still more remarkable, to detract from or obliterate the chief merits of a first-class print by an unsuitable mount, or an inharmonious frame.

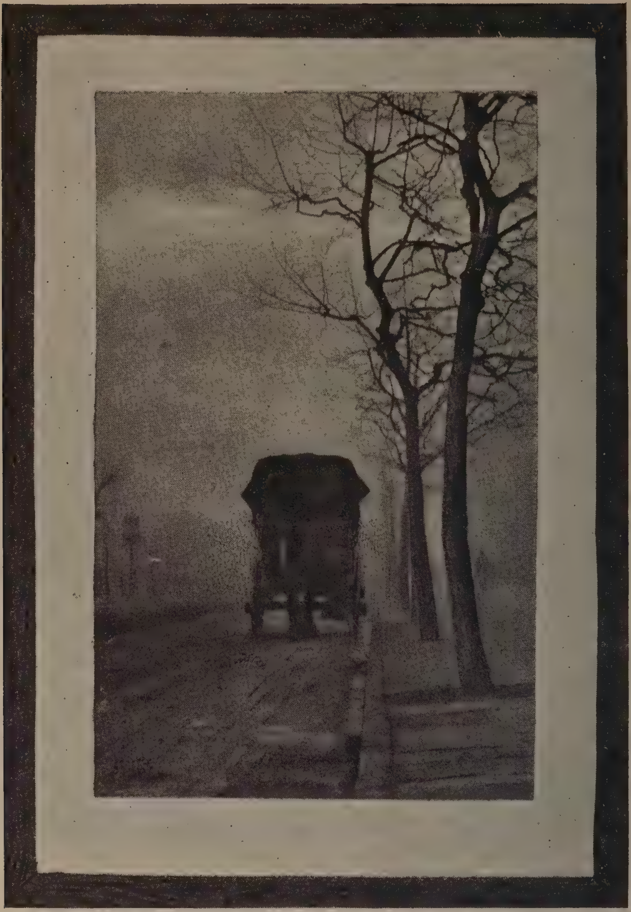
It is impossible to give more than a few general hints on the subject, but perhaps the two keynotes of successful mounting and framing are contrast and harmony, the first being the most important. Contrast, of course, is that principle which supplies some missing quality, or distracts attention from a fault, by offering simultaneously for comparison something in which that lack or blemish is much more conspicuous.



LOW-TIDE.

Figure 2.

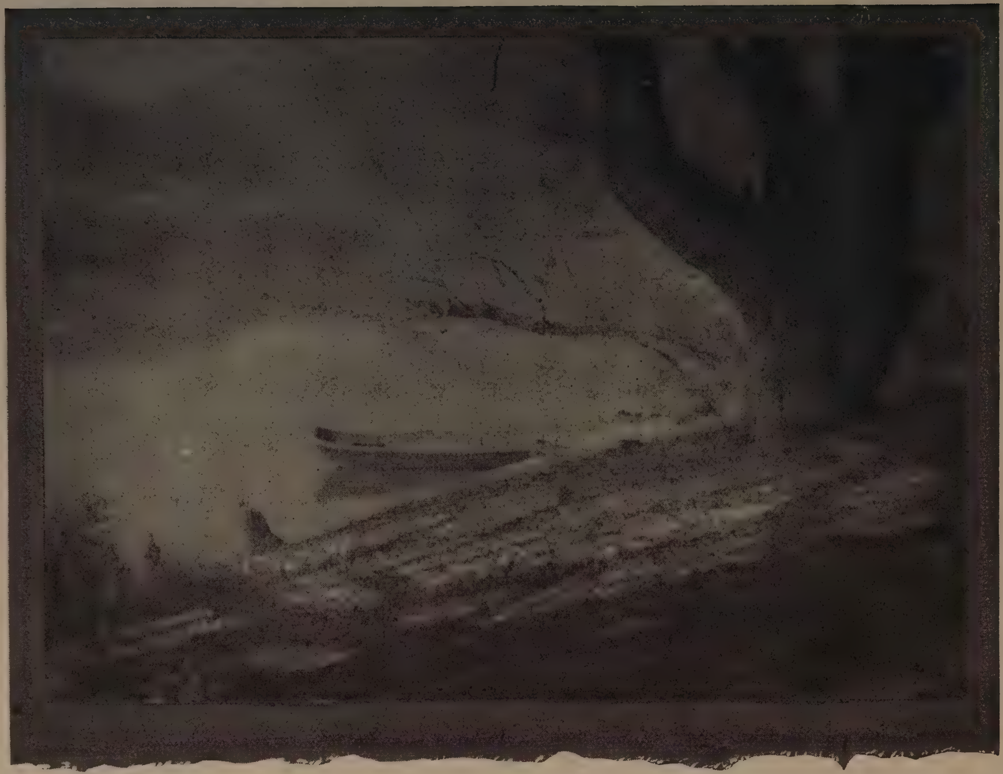
The first question to confront the worker when framing a print is whether or not any margin of mount shall be visible. It saves a good deal of thought and trouble simply to frame the print "close-up," but this is only satisfactory with a certain rather indescribable type of picture—as a rule, dark, massive and commanding, or, at any rate, suggesting breadth and space. Here, one needs to bear in mind the contrast principle with respect to the width and relief of the moulding. If the picture tends to harshness and exaggerated relief, let the moulding show vigorous depths and stand well out in front; if the picture is lustreless and flat, let the moulding be noticeably flat and shallow. A large subject, or a print



NOVEMBER.

Figure 3.

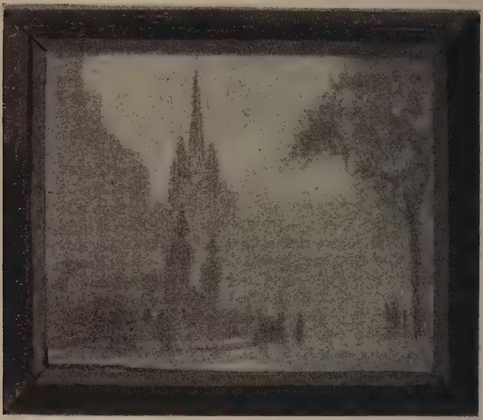
containing some big object, may look well with a wide moulding; whereas a small picture, or one with mainly diminutive objects or delicate detail, will most likely show at its best with a narrow moulding. If the print is over-dark let the frame be darker still; if rather too light, have a lighter frame. The color of the frame, generally speaking, had better harmonize with that of the print. The roughness or smoothness of the wood, and its grain if any, will obviously have some contrast value in comparison with the surface of the print. This needs watching.



INDIAN SUMMER LANDSCAPE. LAWRENCE BAKER.

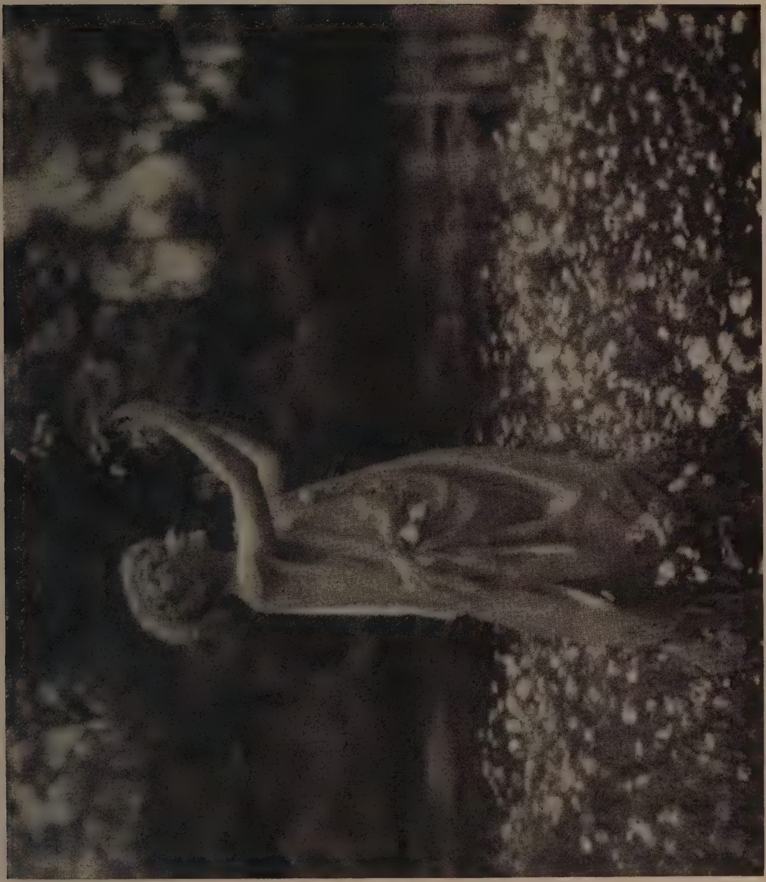
If a mount is used, it should be regarded to some extent as a continuation of the frame, and both studied seriously in conjunction with the print, as essential parts of one final result. The extent to which the print is trimmed is of great influence, but that may be considered as really belonging to the selection or disposition of the subject, and need not here be dealt with.

Not so long ago, the photographic world ran wild over the alleged beauties of multiple mounting, with many borders of diverse tints. It was soon seen, however, that this method of embellishment needed to be used with moderation and restraint, or a distressingly emphatic geometrical surround resulted that clamored for notice a hundred yards off, and completely killed any artistic merit in the picture itself. A border merely for its own sake should be eschewed; but when employed intelligently and deliberately for a given end, and fitting smoothly into the general scheme, borders have their virtues. Thus, a dark border lightens a dark or heavy print, while a light border darkens one that is too light, or helps to tone down a harshness in the high lights.

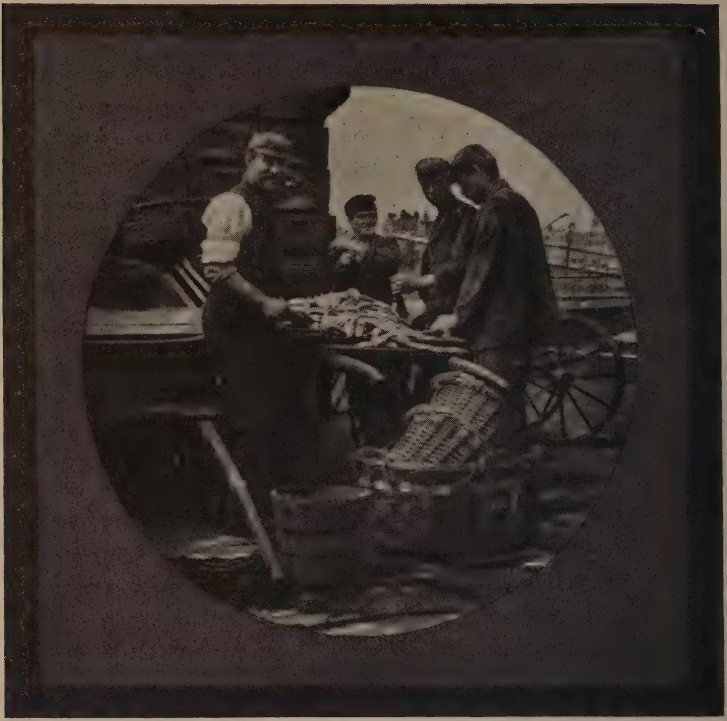


A SUN-LIT SQUARE.
Figure 4.

Color contrast may often be utilized pleasingly in the choice of ground and border, though in some cases different shades of the same tint may be preferable. It is most essential to keep the widths of mount, border and frame in a pleasing



SPRING. DOROTHY JARVIS.



THE FISH MARKET.

Figure 5.

proportion, or there is a suggestion of clumsiness. As a rule, the margin of mount ought to be less than the width of the print, but more than that of the frame moulding. Too wide an expanse of mount dwarfs the picture and makes the frame seem too large; while too narrow a margin has a very unpleasant effect, as if the mount had been designedly cut down to fit a frame too small for it. The width of the border or borders, if any, is largely a matter of taste.

A few examples may, perhaps, serve usefully to illustrate some of the points raised. Thus, in Figure 1, "The Artist," we have a somewhat heavy print with originally a rather hard light on the face. By using a dark mount, and a still darker frame, the heaviness is reduced and much more sparkle obtained, while the narrow cream border tones down the hard lighting. As an opposite case, in Figure 2, "Low-Tide," a delicate seascape, in itself lacking vigor, has been given more contrast by a mount of medium tint, which both emphasizes

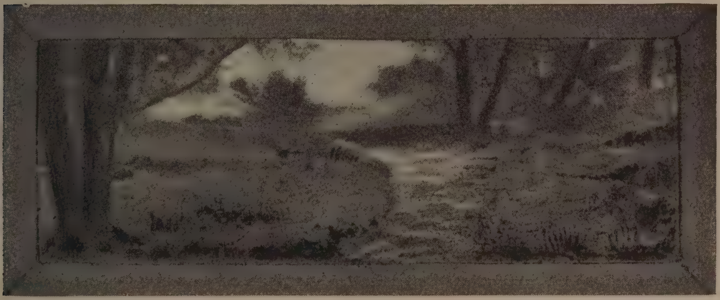
THREE ARCHES. Joseph Petrocelli.

the lights and darkens the shadows, while a light gray frame helps to preserve the suggestion of daintiness.

In Figure 3, "November," the darkening effect of a light mount on a weak and somewhat light print is plainly demonstrated. Here, however, the mount is so handled as to become unduly conspicuous, while the print is made to look a trifle heavy. It would have been better to choose a mount of medium shade in conjunction with a darker frame. In Figure 4, "A Sunlit Square," we see a picture of soft and pearly tones, whose chief beauty is a truthful rendering of luminosity and atmosphere. This would be weakened by a light frame or mount, and, indeed, but dubiously assisted by a mount of any kind. It will be noticed at once how a dark close-up frame emphasizes the peculiar characteristics of the subject.

There is no need to limit one's choice to frames or mounts of conventional shapes. The old masters frequently made use of round or oval frames with great success, but the pictorial photographer seems unduly shy of them. As an alternative, Figure 5, "The Fish Market," demonstrates how well trimming the picture circular and adopting a square frame may suit some compositions. Long, narrow frames, too, may often be utilized to advantage, Figure 6, "A Sylvan Glade," being a typical woodland scene so treated.

It should be explained that, framed prints being difficult to photograph and reproduce satisfactorily, at least in such a way as to point the desired morals, the accompanying illustrations have been built up with dummy frames of tinted paper or cardboard.



A SYLVAN GLADE.

Figure 6.

Illustrating article "Mounting and Framing," by A. Lockett.

THE NEED FOR DESIGN IN PHOTOGRAPHY

By LAURA GILPIN

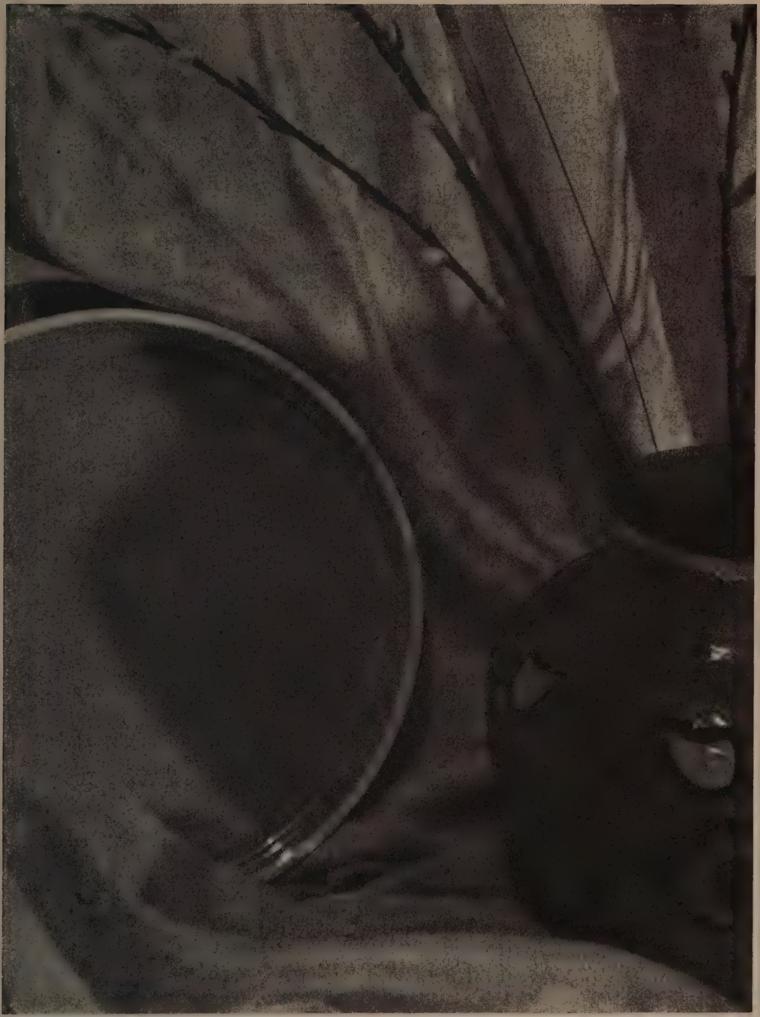
MANY articles are written in these days concerning design in art, yet how many photographers are there who make a study of design and its application to photography?

One essential problem, in addition to the all-important thought of what the picture is to express, is the placing and arranging of the subject matter to be used in such a way that it make a beautiful design, or pattern, in line, mass, light and shade. How are we to accomplish this?

How many photographers are there who use the entire area of a plate without having to trim away unnecessary portions in order to secure their picture? Of course, there are occasional exceptions when one must of necessity use a lens of too short focal length, or when a subject is conceived in a panel. Should we not utilize every particle allotted to us and make the most of it? To do this requires thought and skill. Almost anyone can go out, make a lot of negatives, and then when at home in the workroom figure out by use of rectangles what makes a composition, and what does not.

To my mind this is not creative work. Every time I fail to make use of my full plate I feel that I have made a failure. How are we to acquire this knowledge and skill? By careful study of still life for one thing. Making arrangements of objects of all sorts and descriptions, experimenting with all kinds of lightings, setting ourselves definite problems to solve. These are the five finger exercises and scales of composition. They need not leave the workroom, but what does go to the exhibition walls will be the better for the existence of the others.

One can spend hours hunting for fine pieces of design in nature. They do exist; it remains only for us to find them. Learning to see things is what everyone of us should practice daily. Often one finds fine compositions in line, or mass, but would they be better in another light? Wait and see. Go



STILL LIFE. LAURA GILPIN.

back at all hours of the day and find the time when the light helps the composition, for it is an amazing thing how different a subject can be at different times of the day. Light is one of the most important factors in photography. Do we even begin to utilize its vast resources?

Acquiring the habit of noting the changes of light and watching for designs, fits and makes us ready for those rare moments when unusual and remarkable things happen, which may last only a fleeting moment. These are the things that photography, and only photography, can catch if we are so well trained that we do our part.

How many of us make a true study of art as a whole? How many of us are intimately familiar with the works of the masters of etching, and the other graphic arts as well as our own? I do not mean that we should in any way imitate, for when a photographic print imitates another medium I think it is a failure. If the qualities of another medium are desired, would it not be better to work in that other medium?

Do we study and analize the masterpieces of painting and sculpture? Is it not true that the more we know of other arts, the more that knowledge helps us in our own? Do we seek the beauties and qualities that are peculiar to photography and make the most of them?

Ours is a new art, a most wonderful art. It is just one hundred years old. Our background is light compared with all other mediums. It is for us of the living generation to add to what has been done as a heritage for the future.

PARADISE VALLEY. F. C. NEUPERT.

ALPINE PHOTOGRAPHY

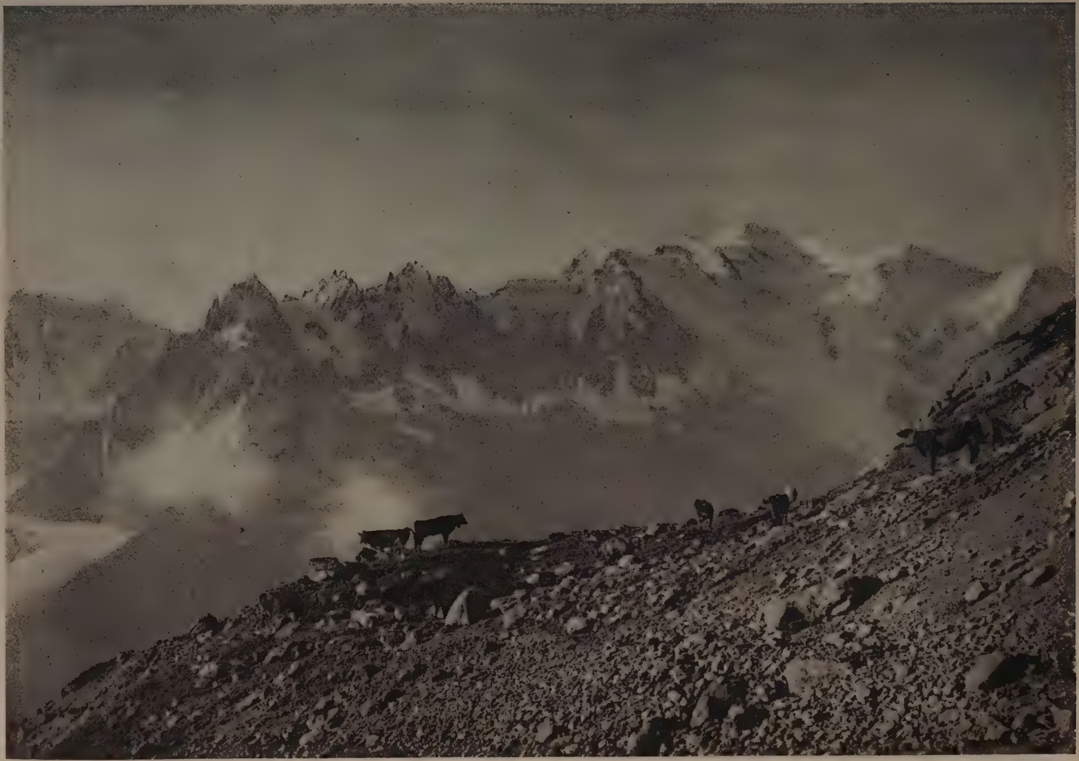
By LOUIS J. STEELE

"YE mighty snow-clad peaks, towering so high that clouds ofttimes enfold you—ye hold in your embrace glaciers unknown and fields of snow unmeasured, that feed the constant torrents, rushing down your rugged sides, that seem in the far off like silver threads woven in the rich and varied green that clothes your base."

Photography in the High Alps may be justly looked upon as one of the most difficult, and at the same time most fascinating branches of the art, for its aim is to portray nature in its sternest and most varying aspects. The mountaineer who adds photography to his pursuits should be prepared to apply himself seriously to its study, and should bestow a considerable amount of care and time on the development and after treatment of his negatives. The era of successful Alpine Photography may be said to have commenced in 1879, when Mr. W. F. Donkin astonished the Alpine fraternity, and the photographic world, with his series of beautiful pictures which undoubtedly emulated a spirit among them to go and do likewise.

Their task has doubtless been much lightened in later years, owing to the perfection which has been introduced in the manufacture of photographic apparatus and material. One of the main considerations is in deciding on the nature of one's outfit. The recommendations which I am making are destined chiefly for the mountaineer, and not for the tourist who confines his efforts to the valleys, and to the sub-Alpine world. His work comes within the scope of the ordinary landscape photographer who will find ample information in the numerous existing text books on the subject.

The ideal camera is one which combines minimum weight with the maximum strength and portability. The design of the camera should be as simple as possible—the greater the number of complications the more likely is the camera to get out of order at the critical moment. The size of picture which such a camera should take depends to a large extent on individual



THE MONT BLANC RANGE AT SUNRISE.

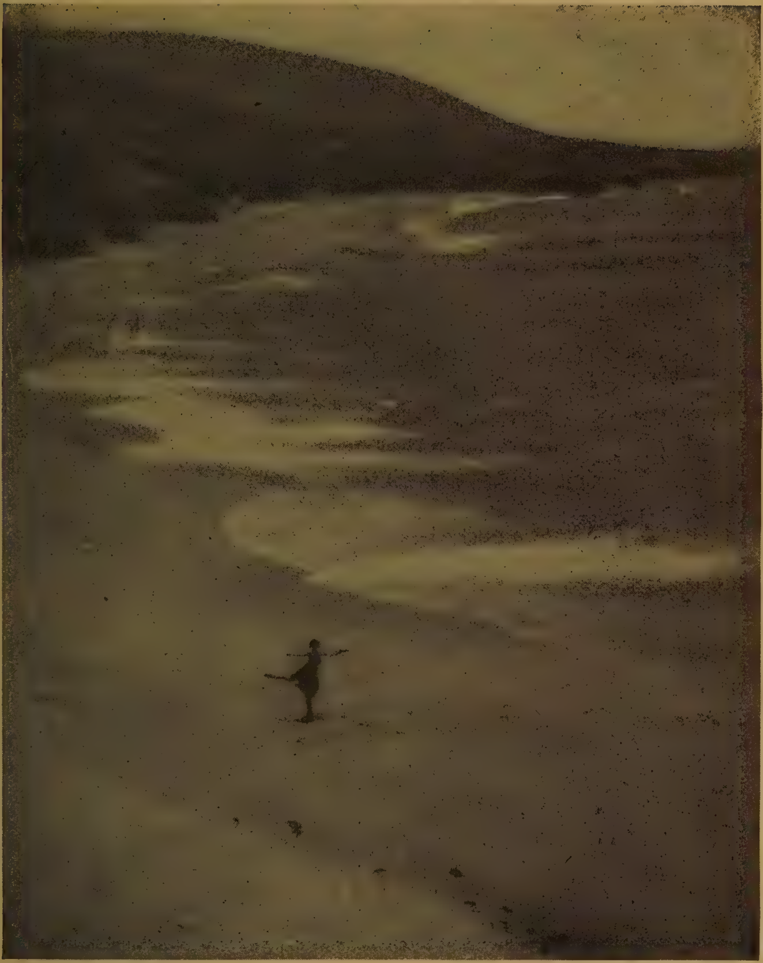
Illustrating article "Alpine Photography," by Louis J. Steele.

taste. Owing to the perfection of modern plates and lenses, and the opportunity we have in consequence of enlarging our pictures, I consider that a 4 x 5 camera is the largest size which need be carried with any degree of convenience. A quarter-plate size may even be preferable from several points of view.

If, however, one's photographic apparatus is to be carried by a porter or a guide, then the size may be increased to half-plate, but on long expeditions, where other considerations must be given to the contents and weights of one's sacks, some sacrifice will have to be made unless an extra porter be engaged. Such a course apart from materially adding to the expense of one's mountaineering season, will also prove a source of delay, owing to the fact of having an additional man on the rope. The late Mr. Donkin used to carry his own 7½" x 5" camera, together with three or four dark slides and three lenses, the whole fitting into a waterproof case and weighing 15 pounds exclusive of tripod. He considered that this was the largest size which could conveniently be carried. It is considered doubtful whether the increased size and weight of such a camera over the half-plate, or smaller sizes, compensates for the increased size of the picture for the reasons above stated.

Should the carrying of one's apparatus be delegated to a guide or porter, it will probably result in many a good subject being lost, for when on a difficult place on a mountain, one does not care to risk the safety of the party, apart from incurring the loss of valuable time by obtaining the apparatus from the individual who may be some distance off, perhaps at the other end of the rope.

In view of the above considerations it is considered advisable to carry one's outfit oneself and to limit the size of the camera to quarter-plate or 4 x 5. This camera should be capable of being used in the hand, or on a stand, and should be designed to take ordinary slides with a view to using glass plates, a film pack being advantageously employed as a reserve. The type of dark slide with the slide which draws right out is not recommended, owing to having to hold a loose part during exposure, and also owing to the risk of fogging the plate in replacing same—for it should be borne in mind that the penetrative power of light at high altitudes is very great. For this reason the entire woodwork of the camera and slides should be painted with a dead black.



WHIRLS AND SWIRLS. Louis Fleckenstein.

The best type of slide to use is the one provided with a cover which folds back inside the camera during exposure in the same manner as the cover of a book. A reliable changing-box will be found most convenient on long expeditions, but it should be of a type in which implicit faith can be placed.

The conditions to which one's photographic outfit will be subjected will be far more severe on the score of usage, weather and temperature, than it would under the ordinary conditions of landscape photography. The workmanship and material should, therefore, be of the very best. The camera should be metal bound, aluminum being used to reduce weight. When a stand camera is used a swing back will be found useful and in any case, a rising front for both horizontal and vertical positions is essential. All the movements of the camera should be simple, of strong construction, and easily operated with the hands, which may be numbed with cold. All thumbscrews should be so arranged that they cannot be screwed back more than a certain distance. I have found the use of a revolving adaptor for taking vertical or horizontal pictures a great convenience, thus eliminating the risk of dropping a loose and vital part. A spare celluloid focusing screen should be carried to replace probable breakages. The camera should be provided with levels.

Before starting on an expedition the camera should be carefully tested in all its working parts. On account of the searching effects of light, and owing to the large amount of reflected light from snow and ice, a lens-hood as well as a focusing cloth, should whenever possible be used as a protection during exposure. Such a cloth should be made in the form of a bag, provided with elastic around one end for the purpose of holding it round the body of the camera, the other end being sewn so as to form a hole underneath for the admission of one's head for purposes of focusing, etc. This device will be found most useful in a high wind. As mentioned before the camera should be provided with levels.

Whatever type of shutter is employed should be accurately timed. It should be capable of adjustment from ¼ second to 1/100th. A shutter of the roller blind type, either focal plane or otherwise, is the one least likely to get out of order. If the shutter is to work near the lens it had perferably be placed behind it for the purpose of protection. Although the shutter is provided, the lens cap should nevertheless always be taken, and it will be an advantage if this can be stored in the camera.

The best apparatus is likely to get out of order at times, and it is, therefore, recommended that one's outfit should be supplemented with a few repairing tools consisting of a small screw driver, a few small wood screws, some fine wire and a tube of Seccotine.

With regard to the lens, the most useful all round instrument is one of the modern rectilinear type of about 5½" focus for a quarter-plate camera, the maximum aperture of which should not be less than F/6.3. The camera should be provided with an extension to enable the several combinations of such a lens to be utilized. The fact of being able to use the long extension will prove most useful under many conditions. It will be found an advantage if the idle lens can be stowed in the front of the camera. The lens should be provided with an iris diaphragm, and the mount should be engraved with the scales of apertures for the focal lengths corresponding to the different lens combinations.

Although in mountaineering photography it is not so essential to employ a lens working at so large an aperture as it would be at lower altitudes, owing to the increased actinic value of the light, yet such an instrument will prove of undoubted utilitv in enabling one to take moving figures at "close quarters," and also to utilize a color screen with isochromatic or panchromatic plates in a hand camera. For some considerable time past the use of telephoto lenses for the production of pictures of distant objects has obtained some popularity amongst mountaineers, and there is no doubt as to their utility from a topographical point of view. I am, however, inclined to question their power for the production of pictorial subjects.

Telephoto work in mountaineering is open to considerable difficulty, owing to the distortion of the light rays through long distances, caused by the heat which is reflected from rocks and snow resulting in the blurring of the image. For distant subjects it is advisable to employ an isochromatic, or panchromatic plate with a color screen, on account of the thick layer of atmosphere which intervenes.

Owing to the high magnification in telephotography the slightest vibration will be to the detriment of the picture. Every precaution should, therefore, be taken against it in employing a sufficiently rigid camera and stand. Such an outfit

AN ALPINE DAWN.

Illustrating article "Alpine Photography," by Louis J. Steele.

will necessarily prove weighty and bulky, and for this reason will not commend itself to the mountaineer.

If it is decided to use one's camera on a stand as well as in the hand, it is necessary that this portion of the apparatus should be capable of folding into short and compact dimensions, the length when folded not exceeding about 12 inches. Any appreciable increase on this length may prove a source of danger when climbing. The camera should be provided with a method of quick attachment to the stand, and if a screw be used, it had better form part of the tripod. The legs of the tripod should have a wide range of adjustment in order to adapt themselves to difficult positions which will exist in the majority of cases. If the tripod be provided with a universal head this will be found of great use for readily adjusting the camera in the required position without wasting time and temper in adjusting the legs. Indeed I consider that such a fitting to the stand is almost a necessity. A warning is necessary when using a stand on snow or ice. The points of the tripod may have been warmed by the sun—care should, therefore, be taken to wait a few moments until the metal points have reached a sufficiently low temperature to prevent them from sinking—otherwise motion will result. A useful plan is to fix discs of cork to the points of the tripod to prevent the legs from sinking.

It may frequently happen on a mountain that a time exposure will have to be made in a high wind, the velocity of which may be considerably higher than what we are used to on the plain. Under such conditions it will be found useful to steady the camera by means of a cord fixed to the tripod head and kept taut by the foot. In cases where a time exposure is necessary, and a stand is not available, the ordinary ice axe carried by mountaineers will be found of great utility as a support, still more so if a suitable clip is carried for securing the camera to the head of the ice axe, the point of which is rested on some solid foundation. Even in the case of instantaneous exposures it is recommended that this device should be made use of, and that the camera should find some additional support to that of one's hands, for under the conditions of mountaineering there is a risk of movement due to unsteadiness of the hand and also to one's rate of breathing and to one's increased heart action. Under such conditions the ice axe will prove invaluable as a support.

THE GLACIER.

Illustrating article "Alpine Photography," by Louis J. Steele.

We next have to consider the best mode of carrying the outfit, especially when doing so one's self. The bag now universally used is called a ruck-sack. This bag is destined to carry all the impedimenta which go to form the sum total of the owner's happiness and perhaps discomfort. Such bags are usually made of waterproof material which offers the requisite protection to the effects of weather. The contents of a ruck-sack may not, however, always form congenial associates to the refinements of one's photographic apparatus. Wet stockings, or ripe fruit, in contact with the lens are not calculated to improve its optical properties. I therefore, recommend as the outcome of a good many years experience, that the camera should be protected by a light case of Willesden cloth, and that the dark slides should be contained in a separate case of similar material. A light lining of Willesden cardboard will form an additional protection to the slides and to the focusing screen. A lock on the case containing the slides will prevent the curious from gaining an insight into its contents. Small accessories, such as an actinometer, notebook, etc., can be placed in one of the pockets with which the ruck-sack is usually provided. It will, however, be found when climbing that under some conditions it will be far from convenient to remove the ruck sack from one's back to get at the camera outfit, resulting in the loss of good subjects.

It is, therefore, recommended that if a quarter-plate camera be used, and provided this folds into a sufficiently small space, that it should be carried in a specially made breast pocket which will button to the left hand side of one's coat, the dark slides being carried in the side pockets. These pockets should be lined with waterproof material and should be provided with substantial flaps arranged to button. On no account should an attempt be made to sling the camera over the shoulders in the ordinary way. Not only would such a course be found impracticable and inconvenient during a climb, but it would also prove to be a source of danger by hampering the freedom of one's movements.

Concerning the question as to the best plates to use the point to bear in mind in making one's choice is that the majority of the subjects we have to deal with consist of somewhat heavy contrasts. In order that these contrasts shall not be exaggerated and that the "atmosphere" of our subject shall be properly rendered, it is advisable to employ plates of medium rapidity, and

THE SUMMIT OF MONT BLANC AT SUNRISE.

Illustrating article "Alpine Photography," by Louis J. Steele.

avoid comparatively slow plates. When hand exposures are to be made, then some plates of suitable rapidity should be included.

Always use backed plates. These are, however, unfortunately associated with the undesirable production of pinholes which are no doubt caused by the vibration of the plates in their slides. After many experiments with a view to overcoming this trouble, I have found that a cure is to be found in the application of a sheet of tissue paper (slightly larger than the dimensions of the plate) to the backing while it is still tacky. Some of the plate makers have provided me with backed plates treated in this way. This refers only to plates which are backed with the caramel backing.

For general mountaineering work I do not consider that there is any great advantage in the use of isochromatic or panchromatic plates, the chief object of which is to give a more correct rendering of color values. They, however, prove useful in emphasizing the presence of light clouds on a blue sky, and also in accentuating the delicate gradations on snow and ice. They are of assistance in rendering distance, and in softening the somewhat heavy shadows which are found in the Alpine World.

Where the subject consists of a foreground of dark vegetation, such as fir trees or of warm colored rocks, then color correction plates in conjunction with a color screen will prove distinctly advantageous. This also applies to pictures taken in a hazy atmosphere.

The most suitable screen to use is that of a light primrose yellow, which will increase the exposure by about three times, the object of such a screen being to diminish the effect of the blue and violet waves. A K.1 screen is quite suitable. Such a screen should be readily adaptable to the front, or preferably to the back, of the lens, and when not in use should be arranged to stow in the camera. Although glass plates are recommended for the best mountaineering work, yet films on account of their lightness and compactness, should receive our due consideration. These advantages in addition to their freedom from halation, and risk of breakage, have claimed many advocates in their favor.

It is considered that such advantages warrant the carrying of films as a reserve, but it is not considered that the results obtained from them can satisfactorily replace glass plates.

G. Maillard Kesslere, B.P.

The latter, moreover, can be individually got at for purposes of development, and also possess the great advantage of being more easily retouched both front and back, which is so useful in the production of the final picture.

Assuming, therefore, that glass plates form the bulk of our exposures, their packing for transit home is a matter of considerable importance, which if not properly attended to will lead to considerable disappointment. I have found that the most satisfactory method is to place the plates in pair, film to film, and to bind them together at two ends by means of a strip of gummed paper such as can be bought on small reels at most stationers or photographic dealers. The plates are then packed in their original wrappings and boxes and can thus withstand the ordinary jolting in transit without detriment. The tissue paper which it is recommended should be placed over the backing, will form a useful surface on which to write notes concerning subject, exposure, etc.

Ten or twelve dozen plates will probably be taken away on a three or four week's holiday. The best way of carrying these will be to pack them in a tin box made to the correct size, and provided with a telescopic top, the box being lined throughout inside with thick felt. By this device the stock of plates can be subjected to a considerable amount of jolting and variations of temperature without injury. When travelling it will be found convenient to carry this tin case in a hand basket, which should be of slightly larger dimensions than the tin case in order to include a few accessories. Should it be decided to carry the stock of plates in one's portmanteau, then each packet of plates should be wrapped in a small sheet of American cloth, or oiled silk, and packed carefully in the middle of one's clothes.

When on tour the safest plan is to change plates at night without the aid of a lamp. After a little experience this will offer no difficulty. Take a packet of drawing pins with you, and a sheet or two of brown paper, which will be found invaluable to keep out stray light.

Some workers consider it advantageous to develop their negatives as soon after an ascent as possible. I am of the opinion that the accommodation to be found in most Alpine centers is such as not to be conducive to careful and satisfactory results, especially in view of the fact that Alpine photographs necessitate more careful and individual attention than is the case with an average landscape, and that local development may to a large extent determine the ultimate success of the picture. The advisability of developing a few test exposures is fully recognized, and it is, therefore, recommended that the necessary apparatus be included in one's outfit for the development of a few exposures. Tabloid developers will be found a most convenient form for travelling purposes, and Eikonogen will yield excellent results. This addition to one's outfit will prove a boon on wet days.

The question of exposure at high altitudes is one that can only be decided upon after some experience of trial and error. A reliable exposure meter will form an excellent guide, but this should not be implicitly relied upon. At high altitudes and particularly near mid-day, the shadows are not illuminated to the same degree from the sky as they are at low altitudes. "The darker blue sky shows that the light which at low altitudes goes to make a pale blue sky is to be found in the direct rays of the sun, and not scattered to give a luminous sky. As the shadows are principally illuminated by the light from the sky, it follows that the shadows will be darker at a high altitude than at a low altitude." For this reason among others, the exposure should not be curtailed by the diminished reading of the actinometer.

With subjects showing considerable contrast the best way is to give a liberal exposure to make sure of shadow detail and develop carefully. Captain Abney has also pointed out that as the sun drops towards the horizon the shadows get more illuminated by local reflection, and it is not consequently necessary to increase the exposure until considerably nearer sunset than at home.

When mist is present it will be necessary to curtail the exposure below that which would appear necessary from the actinometer reading. In order to render the distance in open views, and the detail on large expanses of snow and ice, very short exposures will be necessary. Under the last three conditions the use of isochromatic plates in conjunction with a yellow screen will no doubt prove of considerable assistance.

Broadly speaking, the best work will be done in the morning and evening, the glare of the mid-day sun being productive of too heavy contrasts and leading to flatness in the case of snow and ice. The choice of a suitable developer is one which will depend largely as in ordinary photography on the individual

SUNLIGHT AND SHADOW.

Illustrating article "Alpine Photography," by Louis J. Steele.

skill and experience. In ordinary landscape photography most developers will yield satisfactory results. This scarcely applies to Alpine work, where owing to the great variety of conditions and strong contrasts special precautions must be taken in development.

The type of negative to aim for is one possessing abundance of detail and somewhat on the "thin" side. During development one should endeavor to obtain as much detail at first as possible and then to gradually build up density. To enable this result to be attained few developers, if any, will be found as serviceable as Pyro, although some of the one solution developers will be found serviceable under average conditions.

The single solution developers which I have found most serviceable for Alpine work are Eikonogen, Rodinal, Glycin and Adurol stated in their order of preference. An Eikonogen formula which I have found to give excellent results is as follows:

Water	50 ounces
Sodium Sulphite	2 ounces
Eikonogen	1 ounce
Carbonate of Potassium	12½ grains

A few drops of 10% Potassium Bromide being added per ounce of developer in cases of over-exposure. This developer should be diluted with two or three times its bulk of water in cases of under-exposure, or strong contrasts. The activity of Eikonogen varies considerably with temperature. A thermometer should be used to determine that the temperature is maintained between the limits of 68 deg. F. and 75 deg. F. It is not safe to exceed this limit as development may then get beyond control. For every degree below the above limit the image will appear more slowly and contrasts will be harder. In the case of excessive over-exposure it is, however, advantageous to commence with a cold developer. This will keep well in bottles (filled up to the cork and kept in a cool place).

The following Glycin formula will yield soft greyish black negatives with good detail:

Water	10 ounces
Soda Sulphite	625 grains
Potassium Carbonate	1320 grains
Glycin	225 grains

A STOP FOR A CHAT. JOSEPH PETROCELLI.

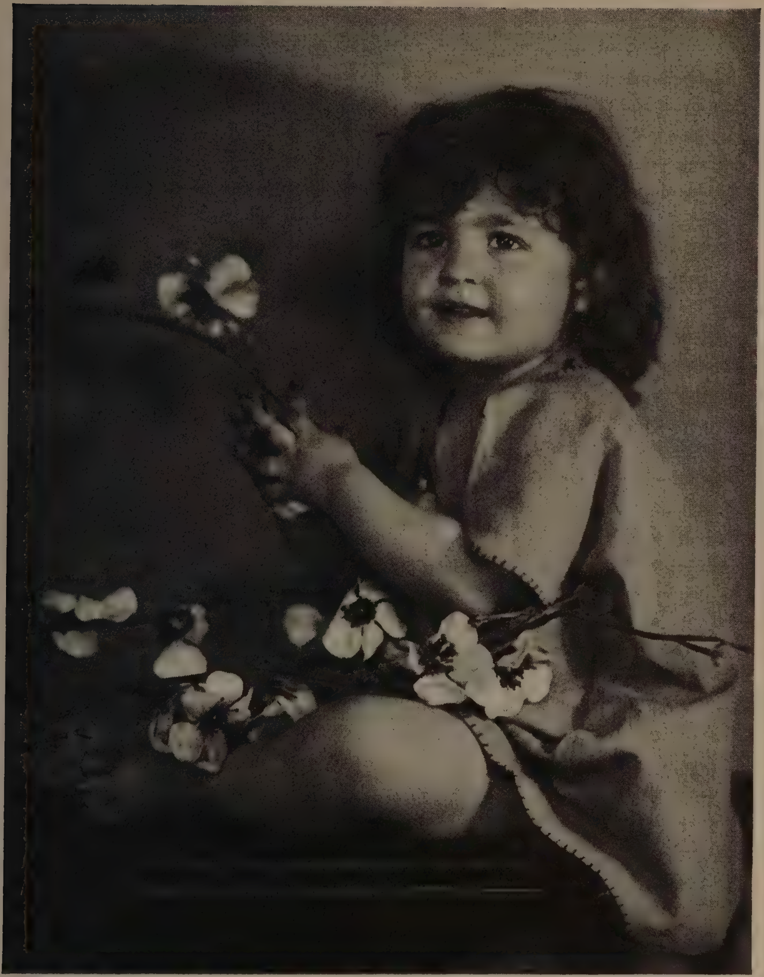
One part with three parts of water for normal exposure.
In the case of under exposure or strong contrast dilute up to fifty times its bulk of water.
Potassium Bromide 10% for over-exposure.

The above solution will not keep well unless kept in stoppered bottles filled to cork.

With regard to Pyro the following procedure was that adopted by two very successful mountaineering photographers. Captain Abney recommended that the plate should be soaked in a solution of the alkali to be used, then a few drops of the Pyrogallol solution should be dropped into the measure with an equal number of drops of the restrainer. The alkaline solution is mixed with this and poured over the plate. A weak image will gradually appear. Potassium bromide and pyrogallic acid are added until it is apparently complete. The plate is then well washed in water, a final wash being given in a very weak solution of acetic acid or citric acid and water. After a final rinse with water the plate is further treated with Pyro and restrainer in the proportions recommended for the ordinary development of the plate omitting the alkali. Density will be built up and when it flags a few drops of the alkali can be very gradually added. The image should be developed to about half the printing density and then fixed. The negative should be subsequently intensified, preferably by the Chapman Jones process. Captain Abney justly claimed that by this method the negative is built up with a greater range of light gradation than by bringing it out with a one solution method of development. He recommended the following solutions:

P.	Pyro dry.	
A.	Strong Ammonia	1 part
	Water	9 parts
S.	Saturated solution Sulphide of Soda	
B.	Potassium Bromide	20 grains
	Water	1 ounce

When the picture has strong contrasts and has been exposed for the shadows take A. 30 minims plus two ounces of water and soak plate in it as stated above, then add B. two drams S. 1 dram and about ¼ grain of P. Pour back the solution of ammonia from the dish, then apply mixture till all details ap-



O. C. CONKLING.

pear and proceed as indicated above. A saturated solution of Potassium Carbonate may be substituted for the ammonia solution.

In the case of Pyro developed negatives in which the contrasts are somewhat strong avoid any yellow stain due to developer, as this will only lead to accentuate the contrasts. An acid fixing bath will prove of assistance to prevent this.

In cases of considerable exposure where it becomes difficult to obtain sufficient density, the use of a 10% solution of sodium citrate will be found most useful as a very powerful restraining solution. A few drops should be added to the developer. This will almost arrest development, which will then proceed at a slow rate, allowing the high lights to build up and the shadows to remain clear.

Alpine photography may perhaps be looked upon as the most difficult form of landscape photography. The subtle gradations of light on the surface of a snowfield or glacier, the delicate mountain drapery of a distant range of peaks, the subtle light and shade of a mysterious cloud effect with perhaps a dark foreground of trees and rocks, are subjects which will tax the resources at one's disposal to the utmost. Yet with patience and experience we are destined to succeed, and the grandeur of such subjects will well repay us for the trouble and care we may dispose on them.

The beautiful coloring of such subjects is apt to mislead us and lead to disappointing results in the final print. A better judgment of the subject will be gained by wearing smoked glasses (which becomes a necessity from other considerations on snow and ice).

Aim at properly balancing the lines of the picture and refrain from trying to include too much.

Figures can with considerable advantage from a pictorial point of view be introduced into most Alpine pictures by virtue of the human interest which is introduced when dealing with Nature in its most majestic moods. Apart from the question of pictorial advantage in introducing figures, they will prove useful in giving an idea of scale. The relative size of such figures is an all important one, and should be decided upon with relation to the character of the subject. Small figures on a snowfield, or glacier, will give importance to its size, whereas on rocks forming an important portion of the foreground it may be ad-

MOONLIGHT ON THE MISSISSIPPI.

E. A. DELCROIX.

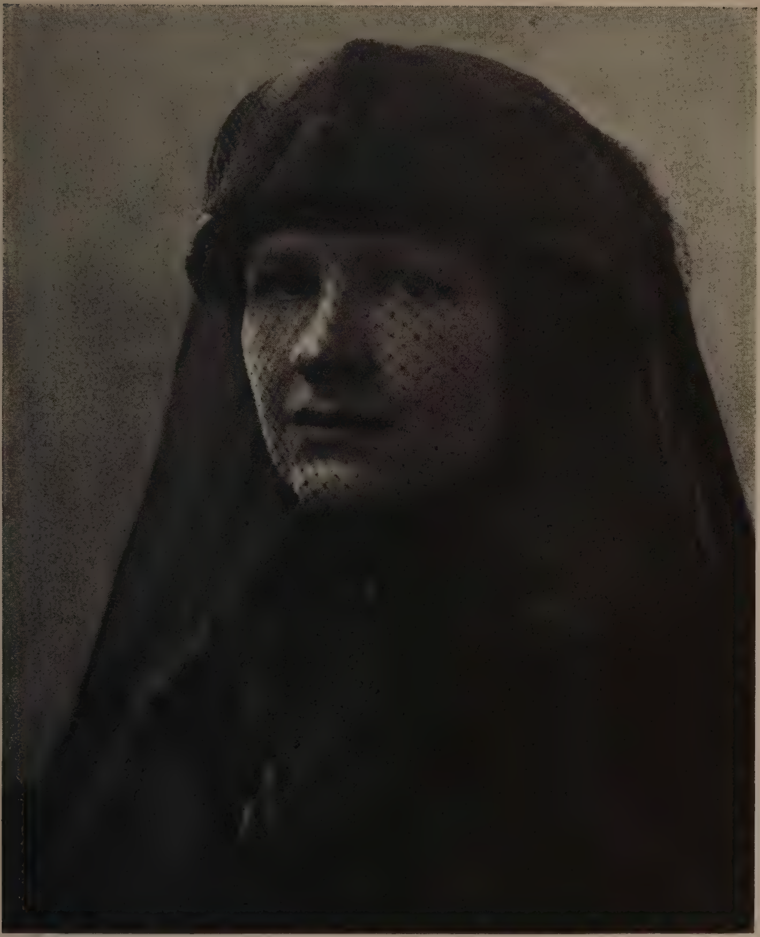
vantageous to keep the figures large, in order to add relief and emphasize the planes of our picture.

The lighting of our subject may determine its success or its failure. A rock peak will be photographically at its best either in the morning or evening when long soft shadows are cast over it. With snow or ice subjects some of the best work will be done when the sun is somewhat ahead of the lens, towards noon—and especially when shadows are cast over their surface by soft clouds. Under such conditions the delicate gradations will be emphasized. The amount of sky to be included in the picture should be carefully considered. Too great an expanse tends to dwarf the scale of the peaks, and on the other hand too little will diminish the sense of atmosphere.

Vertical pictures of Alpine subjects will generally be found to be the most satisfactory, although there are, of course, exceptions to this rule. A picture of a snowfield, or a glacier, with or without figures and an horizon of peaks will probably be found to "compose" better in a horizontal picture. Some of the finest photographs of Alpine Scenery have been taken in the winter when a softer light will be found than in Summer.

The contrasts will accordingly be considerably lessened. It should, however, be borne in mind that longer exposures will be required on account of the lessened actinic power of the light. Clouds may be said to form the grandest decorations to mountains and days on which the weather is threatening, and elected too bad for an ascent will often be the making of many grand pictures. Under such conditions the Alpine photographer often does his best work.

To those who are privileged to listen to the sighing of the wind through the trees, to hear the murmur of the torrent and the booming of some distant avalanche, to see the infinite play of color on the solemn hills, their constant aim should be to embody in their pictures the emotions which such scenes raise within them. The results will be all the more valuable if they bear the stamp of individuality and originality.



LADY IN BLACK. H. R. CREMER.

THE CENTER OF INTEREST—A STUDY IN COMPOSITION

By NICHOLAS HÁZ

COMPOSITION has the same importance to the artist as the plan of campaign to an army at war. There can be no art of any sort without composition, whether done consciously or unconsciously, and yet few photographers even know the real meaning of the word. Just what is composition? Nothing more or less than "Bringing things together within a limited space, in order to produce one new thing." But the question "How shall I bring them together to make a good composition?" would be difficult to answer.

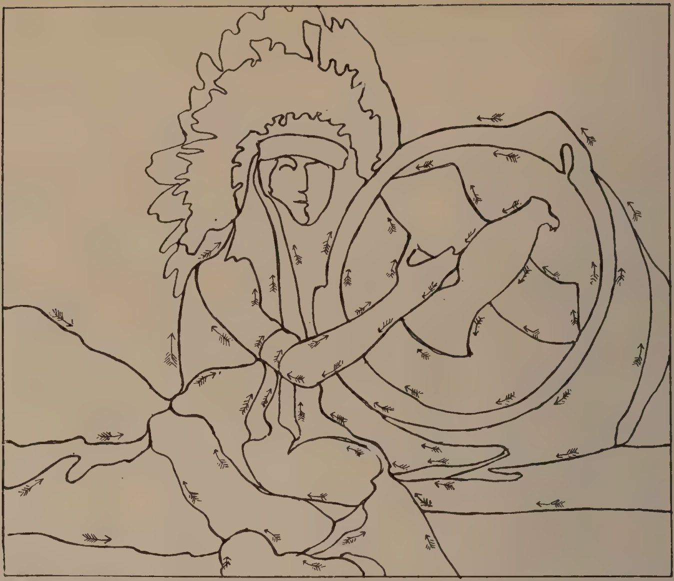
It seems that no man can claim that he knows exactly what constitutes good composition, nor can he tell with unfailing accuracy what does not. Art being purely a matter of taste, it is impossible to do something which will please everybody. All suggested laws, rules and principles of composition, therefore, can have only a relative worth; to take them or leave them will not incur a penalty.

While the principles mentioned in this article seem to be popular with many good artists, they have no binding power; they can be disregarded at will, especially if the artist is a man of talent and originality.

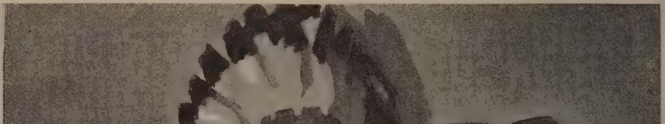
Many of us seem to agree that one should have only one idea in one picture; that no picture is big enough for two ideas; also many feel that that one idea should be brought out forcibly, strikingly. The simplest way to do this is to create in the picture a "center of interest," which in itself embodies the idea. This can be done by selecting that part of the picture which interests us most, and making it of primary importance as the feature. "How shall I feature something?" is then the great question. There are several ways, and in the following an attempt is made to enumerate them in a logical order:

1. It stands to reason that the most interesting, or most beautiful object *per se* should be made to predominate in a

OCTOBER SUNSHINE. G. S. AKASU.

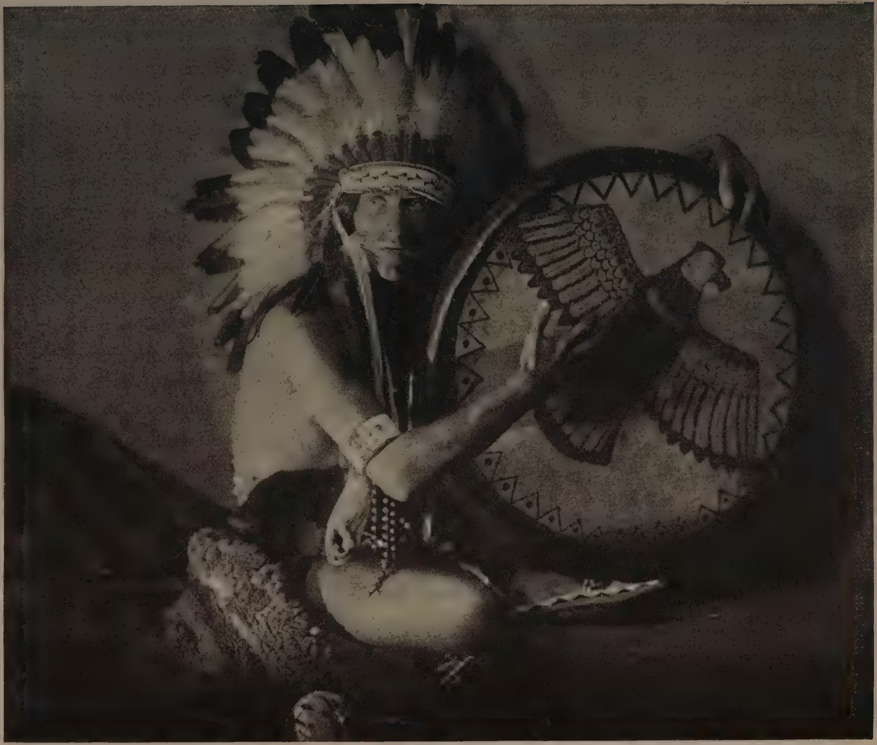


Showing the tendency of the lines of the composition leading up to the center of interest.



This wash-drawing emphasizes by simplification two points: 1, the center of interest contains the strongest contrast of the picture; 2, it comprises the more interesting "spots" or "areas" of the picture.

Illustrating article "The Center of Interest," by Nicholas Ház



Illustrating article "The Center of Interest," by Nicholas Ház.

picture. In a portrait the favorite, or most extraordinary facial characteristic, in a group the most interesting figure, in a landscape the most exciting formation of objects, should have the major importance.

2. The selected feature should occupy an important position in the picture. Not all places of the picture have the same importance, the exact center for instance is a very prominent place, because it is bound to be looked at by most spectators, while the corners and parts near the border are not so regarded, because few people, if any, will look there for the feature. But just because the center is so very obvious the feature should not be placed there, save in some special cases, nor should it be put into an out of the way corner, or near the border or frame. So we may say that the most logical place is the area between the geometrical center, and the extremities of the picture.

3. It should contain the strongest contrast in the picture, where the lightest spot stands nearest to the darkest one's eyes are bound to be attracted. The biggest, smallest, loudest, fastest, the most extreme in everything usually attracts human attention on account of the contrast which it represents.

4. It should contain the most interesting "spots" or "areas" of the picture. If one were to cut up a picture into its component "patches" one would find that some of them would be interesting and exciting, and others would not be so. This again is a matter of taste, and no agreement can be expected on it. The writer likes irregular spots which are neither too simple, nor too elaborate; he does not like geometrically regular, mechanical looking, stiff square spots, nor overly ornate ones too crowded in detail.

5. The main lines of the line composition should lead toward the center of interest. Should one take a picture and cover it with a sheet of tracing paper, then follow with pen and ink the boundaries of the dark and light spots of which the picture consists, one would get a network of outlines, which is called the line composition. Some of the lines would look important on account of their length, formation and position, others would look casual, unimportant, perhaps necessary, but of minor interest. The suggested rule pertains to the former ones.

SNOW-SWEPT DUNES. Raymond B. Ryan.

6. It should be in sharp focus, other parts of the picture may be more or less out of focus.

7. In paintings and color photographs the center of interest should contain the strongest contrast of color within the picture. Pairs of complementaries like red and green, blue and orange, yellow and purple, placed near each other are bound to attract the eye, therefore serve admirably to create a climax to the picture.

8. In moving pictures the center of interest is immediately obvious when something moves. No matter how well this is established in the "still" as soon as something begins to move, the eye will abandon all other attractions and will follow the moving object. This explains why some very well composed moving pictures will yield such poor "still."

Let us now sum up. If a photographer will select the most interesting object of his subject matter, and will place it in a dominating position within the boundaries of his picture, he will then create the strongest contrast of light in or near to this object, taking care that the adjacent spots are more interesting than the others in the picture, and that the main lines of the composition lead up to the main object which is in sharper focus than the rest of the picture—then he will create a center of interest.

FLOWERING DOGWOOD. ALBERT WILLIAMS, JR.

BRET HARTE CHARACTERS.

Illustrating article "San Francisco Through The View-Finder," by George Steele Seymour.

SAN FRANCISCO THROUGH THE VIEW-FINDER

By GEORGE STEELE SEYMOUR

THE one indispensable thing for the amateur photographer to know, if he is to be dignified by that title, is how to take a picture. His knowledge of camera-craft may be only rudimentary, he may get others more expert than himself to do his developing and printing, and the resources of the air brush may be beyond his ken, but if he does not know how, when and where to press the button, he is lost. Using the word "button," of course, in its racial sense, as anything that makes the shutter go off.

But if he does know his buttonology, there is much pleasure and profit for him in amateur picture-taking. He gets to look at new beauties with the photographer's eye, estimating how they are going to appear on a flat surface, just where the picture lies in that tangled mass of shrubbery, and whether there is a picture in it at all. Such is the interest for him in new places. To be sure, you can get an artistic picture out of your own back yard, or the rubbish pile at the foot of the street, but the trouble is that you are too familiar with those scenes; you have ceased

TEMPLE OF MUSIC.

Illustrating article "San Francisco Through The View-Finder," by George Steele Seymour.

to look at them photographically. So you should go off on a jaunt, seeking green fields and pastures new.

Here are some gleanings from a recent trip to San Francisco. In the notes that I have made on these views I have tried also to give a few considerations that occur to the photographic eye.

Bret Harte Characters. This bronze tablet on the side of the Bohemian Club had been set in place not many weeks before I took this picture. The characters are quaint and thoroughly Californian. It is to be regretted that Tennessee's Partner is obscured by the shadow of part of the heavy vine that encircles the tablet, but the Heathen Chinee stands (or sits) out plainly at the right. It is placed conveniently for photographing—not too high up, nor too low down, as is the tablet to Peter Stuyvesant in the wall of Saint Mark's-in-the-Bouwerie (New York). The important thing, in taking a picture of a bas-relief, is to get shadows so placed that they accentuate the design. If it is completely in the shade, although you may still take its picture, you lack the effect of roundness in the figures that shadows give. This is also true of lettered inscriptions, some of which are not visible in a picture when the sun shines directly on them; it is the shadows of the letters alone that we read.

The inscription on the tablet reads; "In Memoriam, Bret Harte, 1836-1902." The club in the wall of which it is set is an old and very famous one, and has long been the literary and artistic soul of the City.

The Stevenson Fountain. This beautiful memorial stands in the center of Portsmouth Square, a small park where Stevenson was wont to come and loaf in the sun, cogitating romances and essays. Stevenson visited San Francisco twice, neither time for long, but the atmosphere of this quaint place attracted him more perhaps than any other spot. It is close to the main thoroughfare of Chinatown; the street given over to display to tourists and not by any means the place of their abode—that is another matter. In Stevenson's time it was known as Dupont Street, and bore an unsavory reputation, but that and much else is gone now. But the pedestal crowned by the Spanish galleon under full sail is unique among the art treasures of our American cities. George Sterling, the poet of San Francisco, who went with me to this park, told me it had impressed John Masefield more than anything else in this coun-

COLUMNS.

Illustrating article "San Francisco Through The View-Finder," by George Steele Seymour.

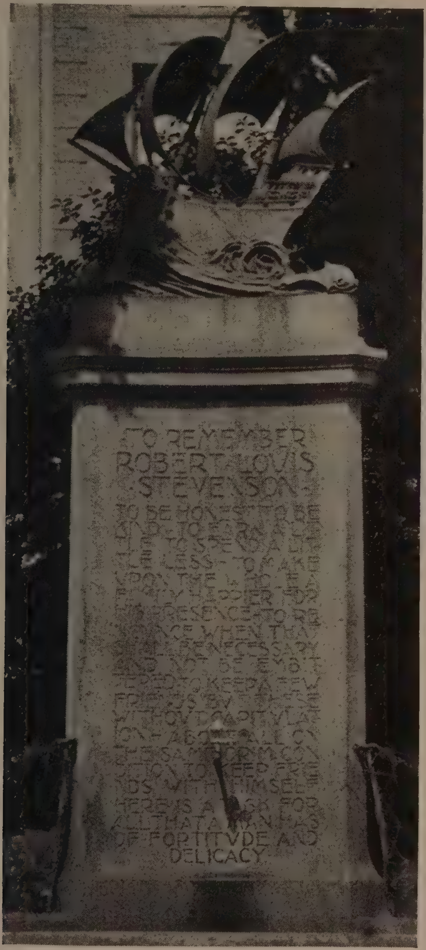
try, and that he had stood before it for an hour without saying a word. The inscription runs:

"To remember Robert Louis Stevenson. To be honest, to be kind, to earn a little, to spend a little less; to make, upon the whole, a family happier for his presence; to renounce when that shall be necessary and not be embittered; to keep a few friends, but these without capitulation; above all, on the same grim condition to keep friends with himself—here is a task for all that a man has of fortitude and delicacy." The words are Stevenson's own.

This monument stands against a screen of poplar trees, and in the screen is an awkward rift that admits a view of some very unpicturesque house-backs and fire escapes. But the main problem for the photographer is to find enough sun on it to illuminate the bronze, which cannot be taken effectually in the shade. The early morning is the time to do this, and it was not until my third visit to the square that I found conditions favorable. The photographer has another problem in overcoming backward distortion, as the park slopes sharply down in front to the monument, and it is necessary to point the camera up-hill. No doubt this distortion exists in my picture, but it cannot be detected because there is no second object in it with which the slope of the monument can be compared.

Temple of Music. This is one of the buildings of the Panama-Pacific Exposition of pleasant memory, now almost a ruin. Plaster has fallen from its walls, and the grasses and flowers have grown into a jungle-like thicket. Millions of bullfrogs assail the incautious stepper. The lagoon, no longer held within bounds, isolates all this prodigal beauty and enhances it vastly. This is an abandoned Valhalla where the photographer will be tempted to stay on until the shadows lengthen, and the view-finder no longer reflects clearly its neglected stateliness. Though you cannot go up to the Temple, the vagrant water at its foot makes a most excellent foreground, and a snap-shot in almost any direction is likely to yield results. No doubt some day the public health will demand the removal of these buildings—let us preserve them in pictures.

Columns. A neglected corner of the Panama-Pacific Exposition grounds, where the untrained shrubbery grows thicker than usual, gives us this graceful mass. Of course, there is no distance in this picture, but the parts of it are so knitted together as to give it unity. It is a ruined temple in the jungle, and the figures peering over the entablature at the top add to its mystery. The trimming at the right has been managed so that there is no line of colonnade to lead the eye out of the picture. and the narrow line of light grass at the bottom finishes it on that edge. Certainly there is only one thing to look at in this picture, and the eye inevitably rests at last on the baffling figures peering over the wall.



STEVENSON FOUNTAIN.

Illustrating article "San Francisco Through The View-Finder," by George Steele Seymour.

SOFT FOCUS APPRECIATION

By JOS. O. HICKOX

IT was not by any miracle of instantaneous enlightenment that I came to an appreciation of soft focus photography. The process was slow, but thorough, and I mark its beginning from a time when I visited a salon with the intention of buying a snow scene. I had a very definite idea as to what a snow scene ought to be, and with that notion dominating I searched the walls in vain. I wanted a snow scene that looked like the snow scenes of my own experience; I found only soft focus pictures that resembled nothing I had ever seen in Nature—Nature simply did not look that way unless you were extremely near-sighted, and had lost your glasses.

I selected one print in particular, and upon it vented my well cultivated animosity for soft focus in general. It was a picture of a sunlit snow-covered cabin set in a little valley closed in by pine-covered hills. It was an excellent example of the manner in which I thought a snow picture ought not to be done, or any other picture for that matter. Detail was conspicuous by its absence, and the longer I looked the greater became my aversion, for there was utterly lacking that chisel-edged sharpness, which is the very soul of a brilliant day in winter. All the pine trees I ever saw in profile against a sky-line were as clean-cut as a steel engraving; every snow-covered cabin I ever saw was so vividly plain that every splinter in its logs could be seen, and every icicle hanging from its roof traced to its needle point; all the snow-covered bushes I ever saw were scintillant with unnumbered miniature suns. That is what I wanted in a snow picture. I could not tolerate having the etched corners of Nature smeared.

I analyzed the picture to the extent of finding that it did not embody the qualities I thought a picture of that kind ought to have, and was so busy picking out things in it I did not like, that it did not occur to me to inquire if there was anything in it I did like, every other consideration being

ALONG THE BANK. Eugene A. Delcroix.

obscured by the assertion, "Nature does not look like that!"

When I had gone through the gallery and found no satisfactory print I decided to return and look again at the questioned one. Looking it over thoroughly I catalogued all its shortcomings, and left again, but as well convinced as I was that it was certainly not the print I wanted, there was some mysterious attraction that kept drawing me back to it. Of course I did not buy it. You see, art was on the other side of the fence, but I had not grown tall enough to see over. However, the important thing is I did recognize the fact it possessed that unexplainable attraction, and I determined to throw all prejudice to the wind and endeavor to trail down the reason for its appeal.

Objections to new modes of doing things are often mole-hills which are seemingly converted into mountains by tricky imaginations. My chief objection to soft focus was that it makes Nature look like it is not, but when I separated myself sufficiently far from my preconceived ideas to get the proper perspective on the matter, this mountain of mine quite naturally reverted to its mole-hill proportions, and I had to admit what I thought an objection was no objection at all, because soft focus does not change Nature—it simply sees it from another standpoint. Soft focus is an interpretation of Nature from a new angle, and has analogies all around us in the different interpretations of the same spectacle seen by different people.

Of course, these thoughts did not occur to me until long after I had been on the trail of the elusive charm of the snow picture; not, in fact, until nearly a year after the salon incident, when I made some discoveries about backgrounds in pictures I had been making. One was an interior portrait for which I had used a stop of F/4.5. By accident the background consisted of a window on the far side of the room through which enough light entered to silhouette some decorations of holly attached to the curtain. In the finished print this background was completely out of focus so that there was no suggestion of actual holly, but there remained a tracery of delicate forms which, while secondary and subservient to the main object, was a very pleasant thing to look at.

The effect quite pleased me, though it was something new in my experience. I had always been openly defiant of that old inexorable law which said backgrounds should be submerged when the object of chief interest was in the foreground. I wanted a photograph of everything in front of the lens, needle-pointed in sharpness from nothing to infinity. A background to serve no other purpose than to be merely a background had no place in my considerations until this one broke over the wall of prejudice, and was recognized by its own merit. About that time I obtained another background which was both beautifully accidental and accidentally beautiful. The picture was a close-up of a small statue in a park, made with a portrait attachment over the lens. The background *happened* to be a clump of bushes about one hundred feet away on the other side of which, and showing through in places, was a white building very brilliantly illuminated. The result was a background entirely out of focus, but consisting of one of the most fascinating patterns of white and black I have ever seen.

To my mind these two backgrounds were truly artistic, and I hasten to add that I do not assume the slightest credit for making them so. In order to test whether or not I was judging them with a biased feeling in favor of the alleged merits of my own work, notwithstanding that all personal credit was disclaimed, I submitted these pictures to an artist of recognized ability and without referring to the backgrounds, or any other quality, asked for an expression of opinion, good or bad, as to their merits. The reply I received was: "The distinctive thing in each of these portraits is the background."

There had now been brought home the fact that art is more a matter of arrangement than mere picturization, the truth of which may be proved in any art gallery, or photographic salon. Take any picture that is instantly appealing to the eye, and it may be divested of all recognizable forms of trees, or buildings, or roads, or what not, leaving only blocked out sections of white and black corresponding to the chief high lights and shadows, and the result is a balanced pattern of light and dark, angles and curves, still pleasing to the eye. The converse will be found true, also, and where there is no appeal to the eye as a picture, neither can a pleasing pattern be evolved by reducing the picture to its foundations.

Now, quite a large group of people are agreed as to what constitutes art. A unanimous agreement is one of the impos-

BOAT BUILDERS.

WILLIAM H. ZERBE.

sibilities of human nature. However, this much is certain: when anything is proclaimed a work of art it is because of its appeal to the sense of sight of the individual or group judging it. I rank my two backgrounds as art because they stand the test of pleasing the eye—*and what are they but the most ultra-diffused soft focus?*

It will be seen that this system of reasoning admits to art soft focus of the most extreme character, even that which presents no recognizable forms, so long as it presents a pleasing pattern. While literally true this statement can be tempered with some justifiable qualifications. Like other things there are soft focus pictures and soft focus pictures. Under certain treatment the result is very much more pleasing than under other treatment, which leads to the satisfying conclusion that soft focus, only to the point of destroying details which do not lend themselves to the pattern as a whole, is better art than soft focus which destroys all detail. This does not eliminate extreme soft focus from art; it merely determines its rank as compared with medium soft focus which is more appreciated by the majority.

Another very important qualification is that a picture is not automatically art because it is soft focus. Promiscuous and indiscriminate photography with a soft focus lens does not produce art. Other means failing soft focus is often drafted in an effort to put across bizarre and outlandish composition, but this misapplication needs no second consideration, since the results can seldom be classed as art.

Infinitely more artistic ability is required to recognize combinations of forms, which when photographed with a soft focus lens will produce art, than is needed simply to make a record with an anastigmat. Personally, I cannot immediately see an artistic effect in a group of factory smokestacks or an old barnyard gate, yet I know there is art in things just as commonplace. Such art is discovered only by the soft focus lens which minimizes the natural harshness of outline, and enhances and vitalizes the usually dormant patterns in light, shadows, and forms. What is there in a knife-edged photograph of an expanse of housetops to let it lay claim to a place in the realm of art? Nothing, but dim out the details with a soft focus lens, and the result is a pattern in light and shadow which entrances the eye.

E. G. BRAND.

I recall one print which well illustrates the simple elegance that soft focus champions. The picture, made in a farm grain-house, included a sack of grain, a bushel measure, and an angle in a wall against which were hanging a number of tattered grain sacks. From somewhere a splash of sunshine fell across the group. That was all, but it was art because there was conceived there a combination of curves and angles, high lights and shadows intensely pleasing to the eye. Only soft focus could do it. That picture made with an anastigmat would have been a record of a sack of grain and a bushel measure sitting in a corner, nothing more.

With an anastigmat pictures are obtained in which light plays a secondary part. In soft focus photography light plays a part in keeping with its abilities—the chief role with objects as accessories. Any number of examples of this principle may be found in recent publications, but I call attention to two in particular which appeared in last year's *Annual,* one facing page 128, called "Tapestry," and the other on page 255, called "The Ravine." These are essentially patterns in light and shadow. Looking at them the eye does not necessarily search for an explanation of what objects are pictured; there is an instant appeal in their pleasing patterns. On the other hand, there is no lack of suggestion because of their lack of detail; it is only that the suggestions and recollections of similar scenes which these prints inspire do not knock you down with glaring conspicuity as they would do in sharp focus rendering.

I know now the reason for the irresistible attraction of the snow picture. It was that exquisitely balanced pattern of light and shadow that appealed even to my untrained eye. Moreover, its lack of confusing detail had freed my mind from the study of minutiae, and in spite of my prejudice which was so busy condemning the picture, it had directed my train of thought to the recollection of the *clear cut* snow scenes of my own experience. Had it not accomplished the highest aim of any picture?

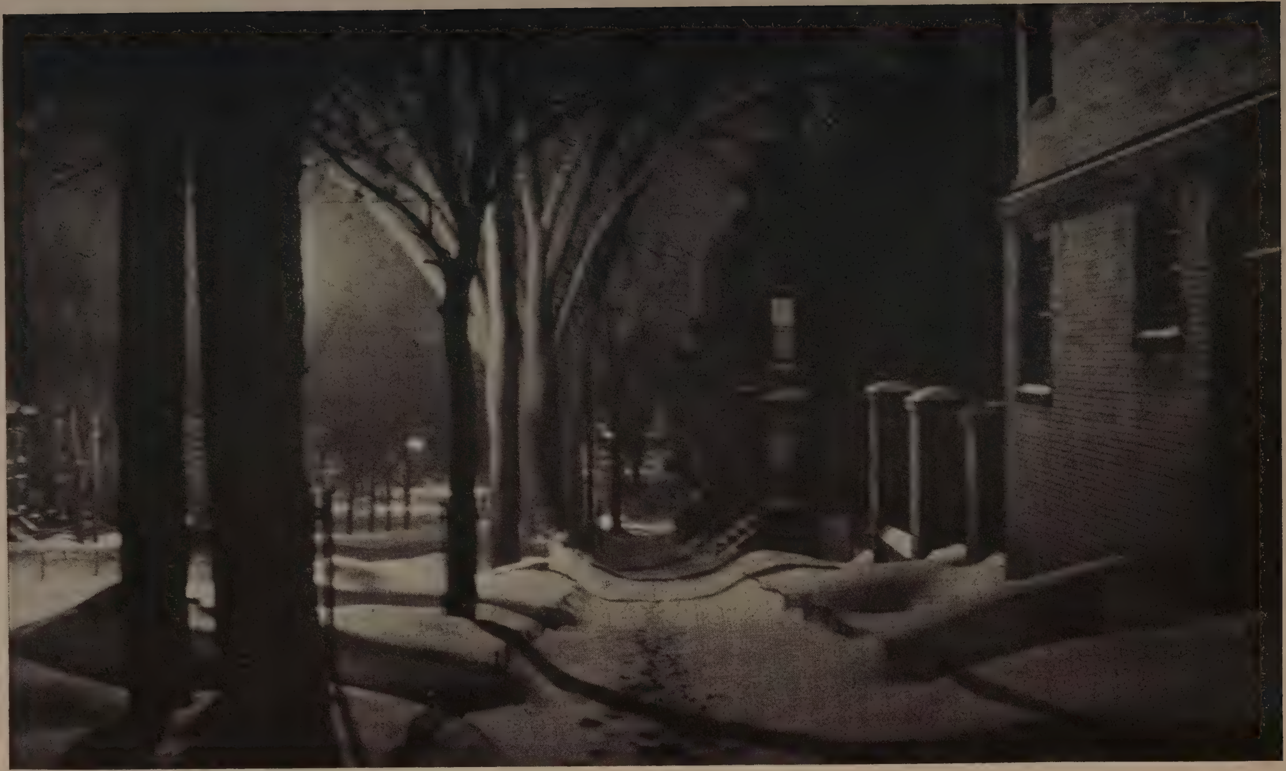
With my growing appreciation of the soft focus lens I have lost nothing of my appreciation of the anastigmat, and it is entirely outside my purpose to belittle it in any way. The anastigmat fills a vastly important place in photography that the soft focus lens can never hope to attain. The most enthu-

THROUGH AIR, SEA AND SPRAY. THOMAS CARLYLE.

siastic champions of the soft focus lens do not aspire to replace the anastigmat. Each lens has its individual sphere of activity, and their purposes do not conflict.

And what I am most pleased to have proved, to my own satisfaction at least, is that Nature is not bemeaned by soft focus. It is to me now more wonderful in that while it plays its own part to perfection, it adapts itself with consummate skill to this new role dictated by man.

WILD GOOSEBERRIES. CORNELIA CLARKE.



COURT STREET—ON WINTER NIGHT.
(*Bromide Enlargement*)

REUBEN B. AZHDERIAN.

A FEW PRACTICAL POINTS IN PORTRAITURE

By T. W. KILMER

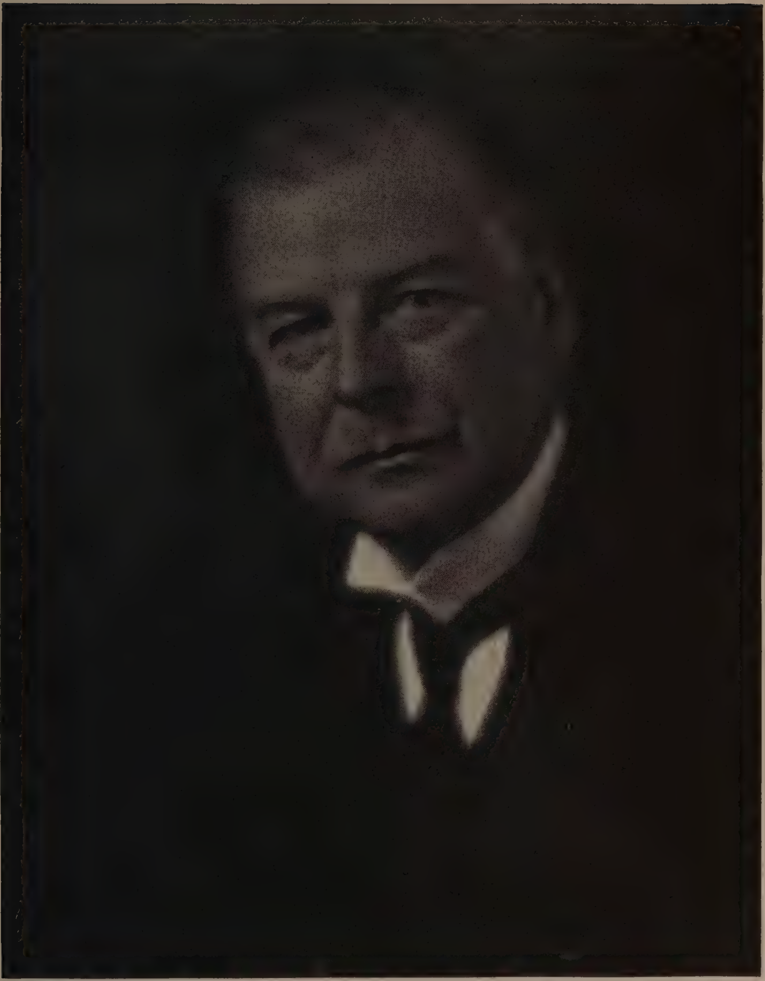
THE LENS.—It is difficult to persuade the average photographic portraiturist to use a lens of sufficient focal length. One should employ a lens whose focal length is not only equal to the diagonal of the plate, but in my own judgment had best be a focal length equal to the combined two side measurements of the plate. For instance, were you to make large heads on an 8 x 10 plate, you should use a lens of 18 inches. You will surely get distorted features if you use a lens of shorter focus.

It may not be flagrantly noticeable distortion, but it is there just the same if you look for it: such as a bulbous nose, ears of different size, a great big shoulder in the foreground, and a small shoulder a little farther back. A large eye, and a small eye. These things should not be present in a portrait of anybody. They are not so in nature and, therefore, should be not so portrayed.

Light—There should be *plenty* of illumination in a good portrait. This light should preferably come from an area rather than from a point. The light from a bank of lamps is better than the light from just one single lamp. The light should face upon the sitter's face from above, and in front of the sitter. It should never be used raw, or unscreened, as the contrasts are too great. Cooper Hewitt light is more or less diffused, and does not need as much screening as does the light from arc lamps or high wattage bulbs.

Plates, Films—Personally, I always use superspeed films in my portrait work, and believe in plenty of time. Large 11 x 14 heads at F./4, using four 50 inch Cooper Hewitt tubes, will require from two to four seconds exposure.

Printing Media—Get used to *one* brand of paper and find out all about it. What it will do. What it will not do. Large heads, especially of men, look best on a rough, buff paper. A large head printed in multiple gum, say, three to six printings, nicely framed, is to my mind the last (permanent) word in photographic portraiture.



THE LATE E. L'H. McGINNIS, M.D. T. W. KILMER.

NATURE PHOTOGRAPHY

By ARTHUR H. FARROW

HOW many of us there are who regard the camera and the resultant pictures as things which are complete in themselves, forgetting that photography may be a means to an end not connected with the art at all. There are many camera-enthusiasts to-day who, through photographing the flora and fauna of the country, have become keenly interested in the study of nature. When one considers how interesting and fascinating natural science really is, this seems inevitable.

Interest is the key to the door of knowledge, and happy is the man who opens that door and enters. Beyond it he will find a new world of absorbing interest that will put him in a better position to get the best out of life.

Some people used to think that bird study was all nonsense, or at best only suitable for women and children, but we have learned that birds are far from being just pretty singing creatures, and are first and foremost active members in the scheme of vegetation, whose usefulness far outclasses their incidental beauty. We have everything to gain by studying them and by helping in their conservation.

The naturalist, the ornithologist, the botanist, are all using the camera to keep records of their investigations, and many of them are making lantern slides for use in class-room and lecture-hall. Nature photography affords innumerable opportunities for unusually pleasing pictorial effects.

With the advance in the purely mechanical side of photography—perfection of cameras, lenses and other apparatus—there has been a corresponding change in photographic methods, especially as pertaining to nature photography. No longer is it necessary to burden oneself with a bulky 5 x 7, or 8 x 10 camera, and a dozen or more plateholders, containing heavy glass-plates. A few years ago, when one wanted to portray nature objects, a large camera was considered necessary—5 x 7 was the size usually selected. How different it is to-day. Cameras

Illustrating article "Nature Photography," by Arthur H. Farrow.

and lenses have been greatly improved, and films have largely taken the place of plates for outdoor work.

If one has a 2¼ x 3½ camera equipped with a good lens, a portrait attachment and a tripod, he has an outfit that is well fitted for a large proportion of the work to be undertaken. Supplement this with a compact camera of the reflecting type, and he is ready for almost anything that comes along. As the most desired pictures must often be made under adverse lighting conditions, the best lens one can afford should be selected. To show the difference in color values, serious workers will find a ray filter necessary when making wildflower studies.

Many workers will say that the 2¼ x 3¼ pictures are too small. For many purposes they are, but if the exposures have been properly timed and fairly good negatives result, enlargements can be made to the desired size. As with cameras and lenses, great improvements have been made in enlarging apparatus. It is now quite as easy to make good enlargements as it is to make contact prints.

Nature pictures can be found almost anywhere if one will only seek them. Out in the country, one will find literally thousands of objects waiting to be pictured—eggs in the nest, frogs in the pond, moths and butterflies, wildflowers and ferns—provided you are equipped not only with the eye of glass with which to take the picture, but the eye of flesh and understanding with which to see. The field is so large that many nature photographers will want to specialize in one of its branches. The wildflowers will interest one person, while another may decide to devote his attention to the birds and their nests. This is perhaps the way that is likely to result in the fullest satisfaction.

Photographing birds offers a most fascinating field, but the period for doing the work is somewhat limited. The best results are to be obtained during the nesting season, but there are pictures to be obtained throughout the year. The winter birds, for instance, may be attracted to our gardens and photographed by putting out the right kind of food for them. Success depends largely upon a knowledge of bird life, or an interest sufficient to cause one to study, make friends with, and understand birds and their ways.

Photographing the wildflowers in their natural habitat is one of the most enjoyable features of nature photography. What a joy it is to get out into the woods in early Spring.

MESS CALL. COL. JAMES M. ANDREWS.

Ferns are pushing up their fuzzy fiddle-heads, violets, anemones, hypaticas, and jack-in-the-pulpits, scramble up through the moss and dead leaves that carpet the woodland floor; little vines with tender leaves, and young shrubs bursting with new sap, help make a fairy maze. From the time when the first skunk cabbage pokes its head through the snow in February and March, until the first frost in the Fall, there is a succession of subjects for lovers of the wildflowers to portray.

Tree photography is another phase of nature work with the camera that is gaining in popularity. Many interesting studies may be made with a minimum of trouble. Trees are all around us, but most of us know too little about them. How many of us can correctly name any except the very commonest varieties?

Although many workers have secured excellent pictures of the large and small mammals, this phase of nature photography presents many difficulties, and requires special treatment and different apparatus. Unfortunately, many of the denizens of the countryside are nocturnal wanderers and all are shy and wary in their habits. Pictures of rabbits, groundhogs, flying squirrels, field mice, opossums, raccoons, deer, foxes, and other species may be obtained by means of a "blind" or set camera, but do not attempt this work unless you have a good stock of patience, and are not easily discouraged by failures. One of the exceptions are the gray squirrels. They abound in city parks and gardens, and may often be bribed with a few nuts to pose for their portraits if their confidence is gained. Charming studies of these pleasing little creatures may often be secured with a minimum of trouble.

This is a large country and, naturally one section will afford better opportunities for securing certain subjects than others.

It is with much satisfaction that we note the growing popularity of nature photography. Each season new workers are engaging in this interesting work. It is a phase of photography that quickly becomes fascinating, and after the first few successful pictures are obtained, it has an abiding interest. Incidentally, the great amount of information that will be acquired regarding nature, and her ways, will prove an ample recompense for the attention devoted to it.

NIAGARA (AMERICAN) FALLS AT NIGHT.

Copyright, 1924, *by*
WM. H. BROADWELL.

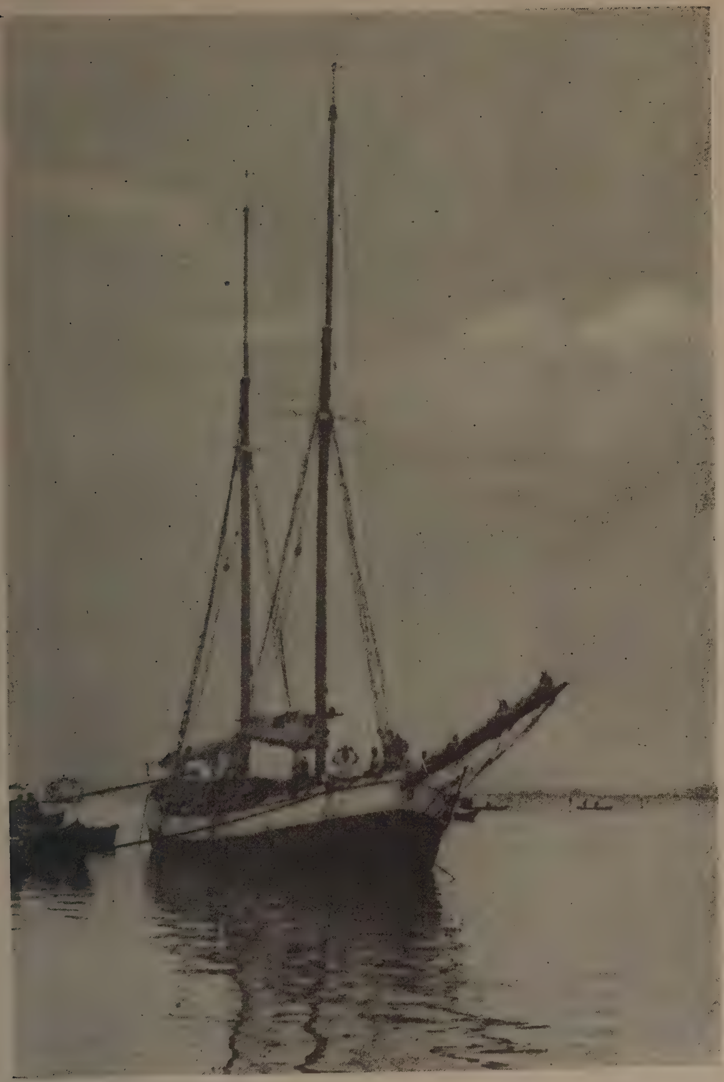
NEST AND EGGS OF KING BIRD. DR. J. B. PARDOE.

THE PRINTING OF PAGET POSITIVES

By C. W. GIBBS

THE Paget process of color photography is gradually becoming more popular in this country, due to its ease of duplication, and to its stability under the heat of the projection lantern. There are a great many Paget workers, but the majority do not take enough care in their work to bring about the beauty in the final results that the process is capable of rendering. One of the steps where the photographer falls down, though perhaps he is unaware of it, is in the making of the positives.

In considering a photographic emulsion we must think of it as having some thickness and imbedded in this thickness are small bodies that reflect and scatter the incident radiations. To get a clear sharp image on the Paget positive not only must the negative be in good contact with the positive, but also the process must be carried out in such a manner that



ON THE LAGOON—VENICE. A. C. FLAGG.

the radiations do not affect any of the silver bromine particles, except where they should be affected.

To prevent the radiations from striking the silver bromine particles under the wrong areas a parallel source of illumination should be used. In practice it will be found that a small source some distance away will prove to be very satisfactory. Figures 1 and 2 illustrate in an exaggerated way the difference between parallel and diffused radiations passing through the Paget negative. In these figures irradiation is left out for the sake of simplicity.

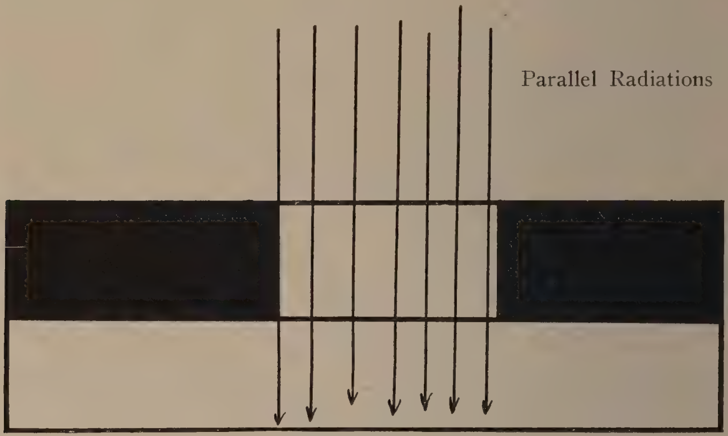


Figure 1.

Another factor that influences the sharpness of the image is the color of the illuminant used in printing. Dr. F. E. Ross, of the Eastman Research Laboratory, a specialist in the characteristics of the photographic emulsion, has shown that by using blue radiations in making an exposure the image will be sharper than if any other color is used. Dr. Ross' work, done with scientific precision, utilized monochromatic radiations, and as this condition is rather hard to realize in practical work, a number of experiments were made on the sharpness of the image when different filters were used in front of the illuminant. Filter No. 49 of the Wratten series gave the sharpest image, and was very satisfactory in all the practical tests that were attempted.

NATURE'S PATTERN
(Bromide Print)

JOSEPHINE M. WALLACE.

In printing the Paget positives the exposure and development should not be prolonged. Give the correct exposure, the correct development, and no more. An increase in these two factors will to some extent increase the graininess in the positives which is especially to be avoided in color positives, as increasing the graininess decreases the sharpness. The development agent itself has a slight influence, but it is so slight that it may be disregarded in practice. The fixing, washing, and drying have little or no effect on the graininess.

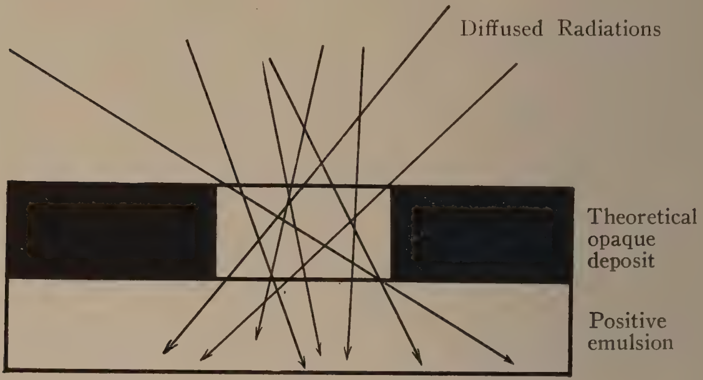


Figure 2.
Illustrating article "The Printing of Paget Processes," by C. W. Gibbs.

SIESTA. O. C. REITER.

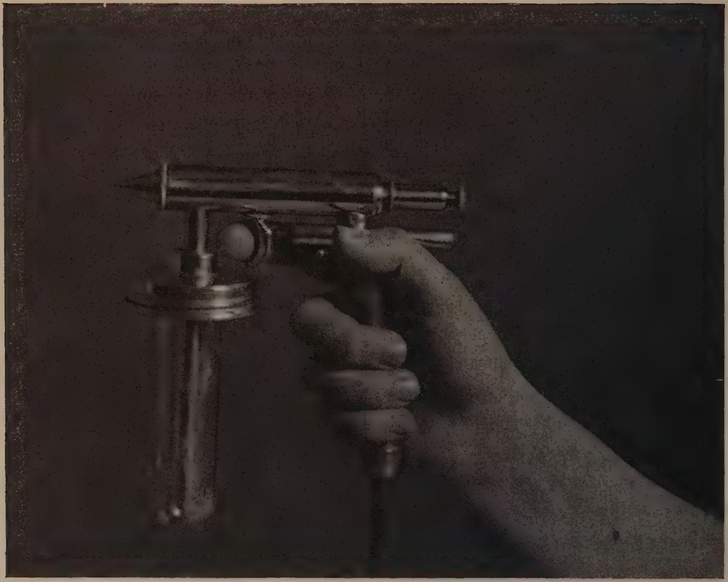


Figure 2.

Illustrating article "Three Convenient Accessories For The Gum-Bichromate Process," by A. Merrell Powers.

THREE CONVENIENT ACCESSORIES FOR THE GUM-BICHROMATE PROCESS

By A. MERRELL POWERS

THEY are the mercury-vapor lamp, the air brush, and the electric hair dryer.

Figure 1 shows an arrangement of apparatus calculated to cheat the sun out of one of its traditional photographic functions. Thus we can work at night, and in all probability faster than by direct sunlight, and with a great deal more certainty, since we do not have to discount for variations in light intensity.

The mercury-vapor lamp is the familiar Cooper-Hewitt M tube, portable, adjustable, and convenient in every way. The illustration shows a distance of about twelve inches between the light and the printing frame, the latter being wheeled into

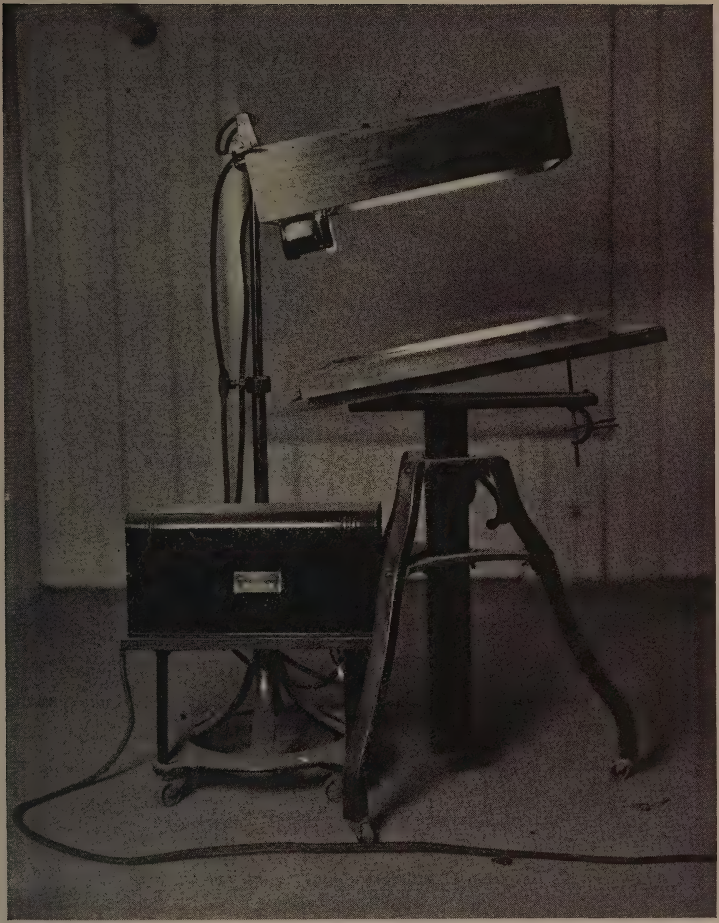


Figure 1.

Illustrating article "Three Convenient Accessories for The Gum-Bichromate Process," by A. Merrell Powers.

position on an ordinary studio stand. This distance is perhaps greater than is necessary for 11 x 14 prints, but the exposures are reasonably short. Using an unstained negative on film, rather thin, such as the process calls for, the exposures range from three to fifteen minutes, depending upon conditions which are familiar to every worker in multiple gum.

If paper negatives are preferred well and good, but they should not be chosen because of any price advantage over film. The difference in cost will be made up in whole, or in part, at the end of the month when the electric light bill is paid. This in spite of the fact that the lamp is very economical to operate.

Figure 2 shows the type of Wold air brush recommended by its manufacturer for gum work. The four ounce jar which is a part of the apparatus has been removed, and in its place a test tube inserted. The test tube has about the right capacity for two 11 x 14 coatings.

The pressure supply is not shown, but the tubing leads to a twenty-pound cylinder of liquid carbonic gas which may be bought for a nominal sum at any dealer in soda fountain supplies. A throttle, and a pressure gauge, form part of the outfit furnished as an accessory to the air brush, and this is simply attached as a unit to the cylinder head.

The operation of the air brush is so simple that a smooth coating can be applied after a very few trials. One precaution, however, should be observed. Unless the nostrils are protected by some means such as damp gauze, or a handkerchief, tied over the head, a small amount of vapor charged with bichromate will be inhaled, with a result which in half an hour's time is very unpleasant, and no doubt dangerous if carried on repeatedly. Prevention in this case is both simple and effective.

The advantages of the air brush over the usual brush-and-blender as a means of coating the paper are as follows:

(1) It is possible to apply a much thinner coating.

(2) It is possible to apply the coating with a differential intensity, or to confine the coating to certain areas, a practice analagous to that of the bromoilist who applies the pigment more or less intensively where he wants it.

(3) The coating dries very quickly.

(4) With many papers it is possible to omit the applica-

DR. K. KOIKE.

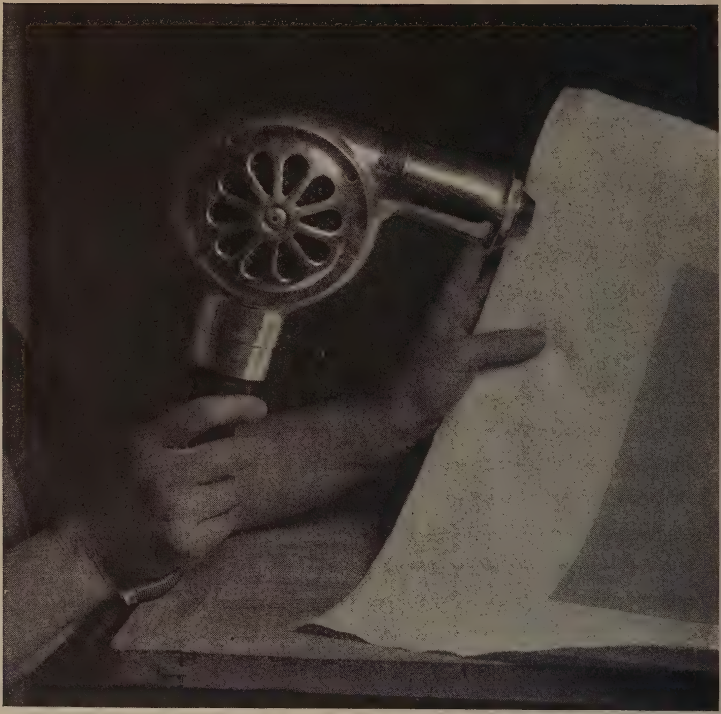


Figure 3.

tion of a size. The pigment is laid on the paper very gently, and the fibres of the paper subjected to no friction. Many of these same papers if brush coated would show specky granulations unless the surface were protected with a layer of insoluble gelatine size. If, however, the margins of the print are to be kept immaculate, thereby answering the purpose of a mount, the paper should be sized, even when coating with the air brush.

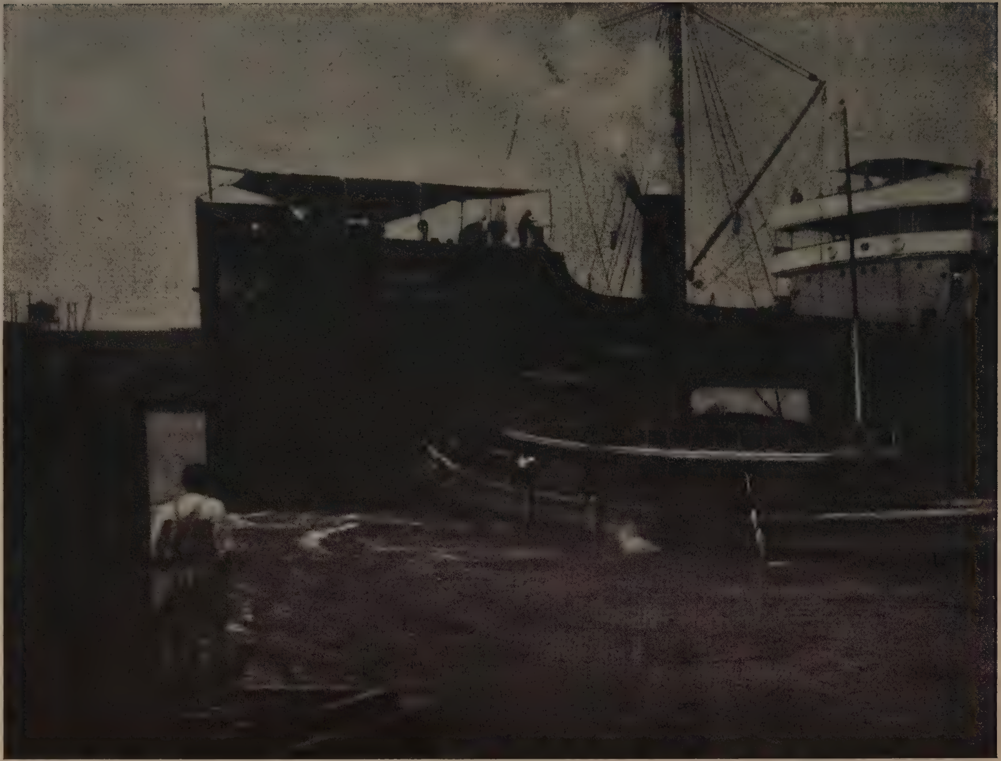
(5) The brush has no hairs to shed.

(6) If the spray is inclined slightly to the paper, that is, if the coating is put on at a slant, it is possible to bring out the texture of rough papers in a very effective manner.

(7) No push pins or thumb tacks to shift. The paper does not get wet enough to buckle, and get out of control.

(8) You can take your time. No need to work fast.

Figure 3 shows a method of hastening the drying operation



COMING INTO PORT
(*Bromoil Print*)

CHAS. A. HELLMUTH.

between development and the succeeding coating, or between coating and the printing by means of a Hamilton hair dryer. Drying in this manner is of particular value after development where one wishes to preserve the margins of the print. It would not be safe to leave the print to drain by itself, since as every worker knows, the margins are almost certain to become contaminated. But if the surface moisture is evaporated, and the margins sponged from time to time, the print may be left safely in a limp condition without further attention to dry by itself.

The chief value of the dryer lies in the fact that we can print almost immediately after coating. Any moisture left in the paper after coating is removed very promptly with the warm blast of the dryer.

In all cases the paper will not stretch or shrink from its original dimensions if this means of drying is employed.

POUND BOAT. JOHN ALLEN.

THEODORE EITEL.

SOMETHING TO THINK ABOUT

By LOUIS F. BUCHER

THIS article to some, may seem to have come from the caustic pen of a pessimist, a grouch or a whatnot, but the author has had many years' experience and association within the realm whereof he speaks, and his custom has been to face the facts.

For the sake of argument let us suppose that you have asked the writer, "Why aren't camera clubs and photographic societies more popular in the United States than they seem to be?" "Why does not the 'button pusher' realize the advantage and pleasure to be had in camera club affiliation?" Well, in the first place we are Americans. By that I mean we like to do things in the easiest way, the shortest manner. That failing of ours accounts for the success of the photo-finishing business. And in a great many instances it is just that. You expose the picture, take it to the corner drugstore and in twenty-four or forty-eight hours have (or have not) a finished print.

Right here let me say that the majority of them do splendid work, and in my city we have found them to be willing to cooperate with the camera club in educating the public to the enhanced value of a picture if it is enlarged, as evidenced by the fact that they put up cash prizes in the name of the camera club for a "vacation pictures" competition. The average amateur has his finished work in a day or two. What could be easier?

Then again, what kind of pictures do the majority of snapshooters take? People—the gang—bathers. How often do you see a good view, a child study, a good marine? Rarely. Why? Well, perhaps it is because they do not know the pleasure of taking them. What one has never had, one never misses, and so the "button-pusher" never misses the pleasure of taking fine pictures and developing them himself—he never has the suspense of wondering what this or that film will

A COUNTRY LANE. Harold K. Frederick.

develop into. And he still believes that the camera is for use in the vacation period, or at most in the summer. The woodlands in the Fall mean nothing to him, so far as pictures are concerned, nor do the Winter snows and games. No manufacturer has thought it worth while to encourage good pictures through the medium of the camera club. To give official recognition to the camera club by encouraging its formation—by calling attention to it in their ads. The public is told that there are pictures everywhere, but no effort is made to help educate the camera users as to what constitutes that picture. The tea interests of India have spent millions in informing the American public that drinking India tea brings refreshment, and it seems to have been successful, if increased sales mean anything. If we can educate the public to drink more tea, why can't we get more camera owners to produce better pictures, and appreciate them, whether it be by the camera, brush, pen or pencil? To me the nation is losing a splendid opportunity to educate the public to an appreciation of art, as expressed by pictures. Teach them to take better photographs, and to know what a good picture is, and they will know how to enjoy paintings.

In England, Scotland and Wales there are camera clubs in practically every city of any size. There are more camera clubs in England alone than in all of America and Canada. There are fewer camera clubs in the United States to-day than there were twenty or thirty years ago. One wonders why, especially in view of the fact that there are thousands more camera users to-day than at that time.

A glance through an English photographic magazine devoted to the interests of the amateur photographer is an education in itself. You will find beautiful pictures reproduced by very fine half-tone cuts on highly enamelled surface paper. All in all, a worthwhile paper issued weekly. It is problematical if any American photographic paper could get enough material together to issue it as often as that. As for advertisements, you will find illustrated ads covering many articles never known of here. Some day the American camera using public will get together in one body and demand attention, but not so long as the attitude remains as to what can you do for me, instead of what can we do if we get together. One solution is for all clubs to belong to the national association, all photographers, amateur, pictorialist, and professional to belong to their local club or society, or lacking one, to form such a body. Then, and then only, will results be accomplished.

The question has also been asked "Are most of the advanced workers members of their local camera club?" Without a census of all such bodies I would not be in a position to answer fairly to all concerned. I do believe that a great many of the salonists, and advanced workers, are not members of their local club, although they may be affiliated with a national body of pictorialists, a local pictorial group, or a foreign society. In many instances this is due to a lack of appreciation on the part of that particular club membership to a man's achievements. It then becomes uninteresting to that member, and he resigns. The club is the loser in this case.

"Are camera clubs as efficient as might be expected?" To this question I can say "Yes" and "No." Yes, in many instances, particularly of late, because they are taking advantage of every opportunity to bring before their members anything of interest that comes along. Many times an interesting evening is made by use of the most meagre material. The one great weakness of the American camera club is lack of efficient management. No business house could exist for long if it carried on its affairs in the same careless manner. There has been a decided change for the better in this connection of late years.

We Americans are making a wonderful progress, photographically speaking, in spite of many handicaps, and it would be simply marvelous if there was cooperation by the manufacturer, finisher, dealer, club, pictorialist, professional, amateur and beginner. There ought to be a general all-round get-together. The writer has the most optimistic views, although this may not have been discernible by reading the foregoing, which has been written with the sole idea of possibly starting something. He hopes it does.

THE NET MENDER. LOUIS F. BUCHER.

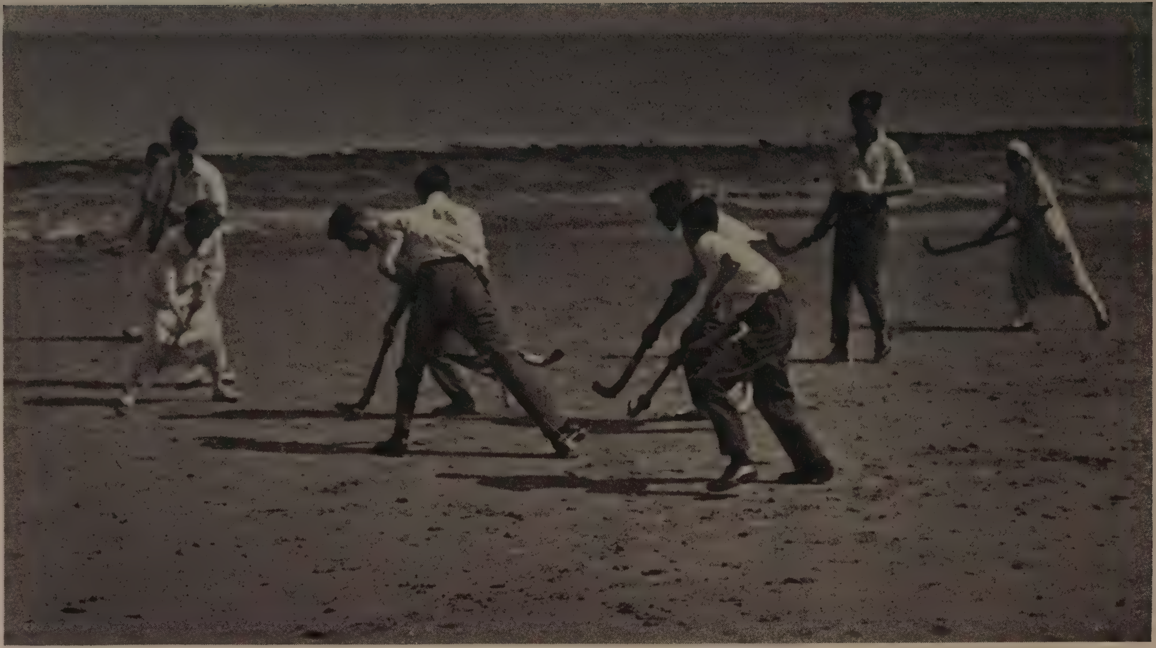
UNDER-EXPOSURE

By A. H. HALL

THE modern photographer has little idea of the time and trouble expended by those of us who, some thirty years ago, attempted to take rapidly moving objects, with lenses working at a maximum aperture of F/7.7, and the plates of that time. The accepted method was a diluted pyro ammonia solution, which entailed constant rocking, the addition of fresh ammonia to make up for that lost by evaporation every twenty minutes or so, and the development of the plate frequently took an hour, while in extreme cases double that time was required.

Since that date the effective speed of plates has been increased, though probably not so much as is generally supposed, and, recently, lenses of hitherto unheard of apertures have achieved wide popularity. Yet with the amateur it is safe to say that most of the failures are still due to insufficient exposure. A better knowledge of the processes involved has shown that dilution is no remedy for inadequate light action, but rather that the maximum energy of a developer is only obtained by concentration.

Roll films, and the cheap cameras made to use them, with slow but efficient lenses, when used under suitable conditions, have increased the number of photographers enormously, but has certainly diminished the average of photographic knowledge. The owners of these cameras rarely have any technique worth mentioning, but are content if they get a certain percentage of prints from those entrusted with the work of finishing their films. Most of their prints bear evidence of insufficient exposure, and the popularity of contrasty gaslight papers, designed to deal with the ghostly negatives which result, has induced the large majority of the public to accept prints with white skies and inky black shadows as the standard of perfection. As, therefore, under-exposure is, and will continue to be, prevalent, it remains to make the best of the existing conditions.



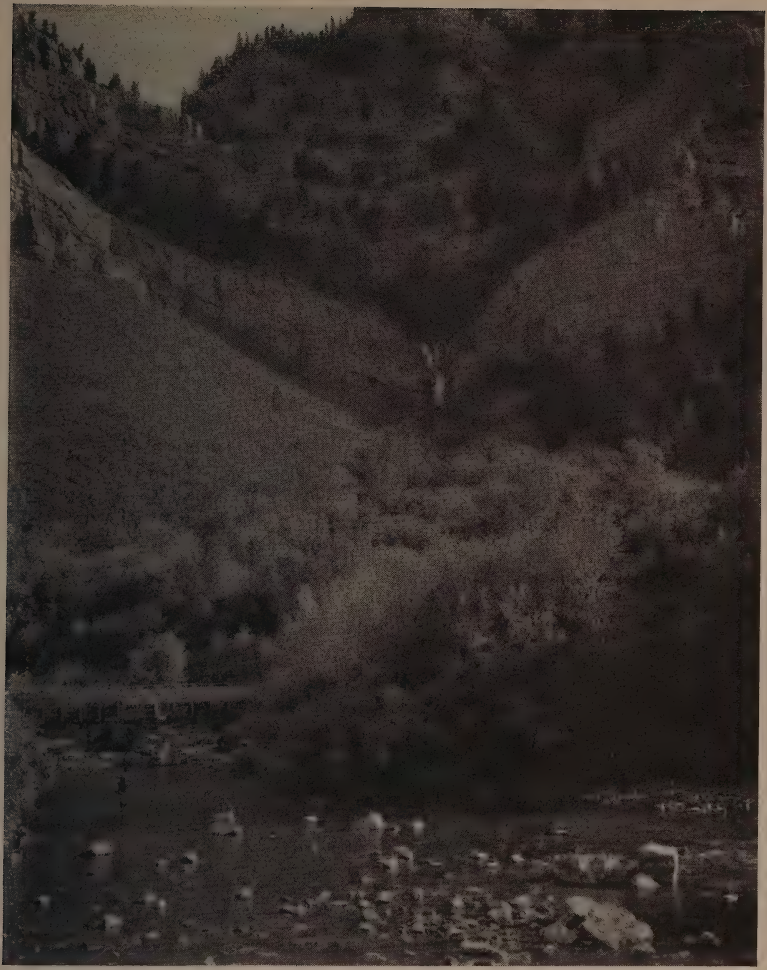
HOCKEY ON THE SANDS
1/500 sec. Medium Speed Plate F/4.5. Under-exposed shadow details brought up by reversal as described on page 233.

Illustrating article "Under-Exposure," by A. H. Hall.

The users of roll film are restricted to emulsions of good speed and great latitude. There is little effective difference in rapidity between the many rival brands, so that all that can be done is in the after processes of developing and printing. The experts, on the other hand, are faced with the claims of rival plate manufacturers, who strive to produce the quickest plate yet made. Here again there is little difference between the best brands, and though plates of the highest speed numbers made for portraiture should be avoided, any preference is chiefly a personal matter, depending on the plate's capacity to resist fog, and give a fine grain under forced development. In practice plates noted at about 450 H.&D. for press work, will usually give identical results with those marked up to 700 H.&D. and contrary to the usual belief, I am of opinion that under extremely adverse conditions an orthochromatic plate gives slightly better shadow detail than an uncorrected plate.

Another factor in under-exposure has not received the attention it deserves, and that is the rapid drop in efficiency of the focal plane shutter, with the narrowest slit provided, used in conjunction with a very rapid lens. It is safe to say that at 1/1000 sec. with an F/2.5 lens few shutters give an efficiency of 50 per cent. The remedy, so far as there is one, is to have the shutter as near the plate as possible, and the travel of the blind at the highest practicable velocity, so that the slit width can be as great as possible. When it comes to the development of minimum exposures certain fundamentals are often neglected. The developer must be as warm as the plate will stand, and maintained at that temperature. The plates should be kept in the pocket prior to development, so that they are warm also. The avoidance of grain is best achieved by using a developer with a low alkali content, but this reduces the energy and is not, therefore, practicable.

Development should, however, be as short as possible; prolonged immersion in the developer always increases grain with a fast plate that requires forcing. Probably this is why Pyro-Metol developers are popular with press photographers. This mixture gives a heavy stain image so that a printable negative is obtained when the silver deposit is quite light. Otherwise there is little to recommend such formulæ,



GEORGE L. BEAM.

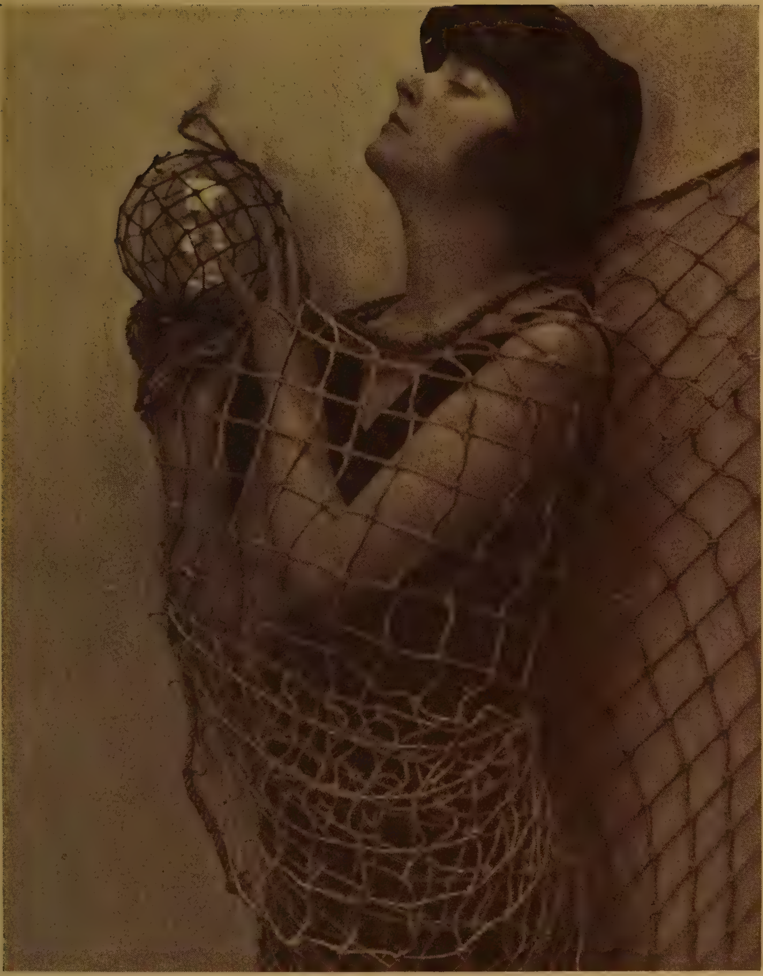
and I find the results markedly inferior to those obtained by the following:

Metol	140	grains
Hydrochinone	140	grains
Soda sulphite (crystals)	2½	oz.
Potassium bromide	88	grains
Caustic soda	88	grains
Water	20	oz.

and when cool add wood alcohol 1 oz. This very concentrated formula was worked out in the Eastman research laboratories, and to my mind stands alone in efficiency. The concentration is such that solution of the chemicals is not easy. Dissolve the bromide and caustic soda in a small quantity of cold water. The Metol should be dissolved in a small amount of hot water after a small proportion of the sulphite has been dissolved. The remaining hot water used for dissolving the sulphite, and then the hydrochinone. When nearly cool these are mixed, adding the caustic soda and bromide solution last, then pouring in the alcohol.

With some brands of hydrochinone some precipitation will occur even then, and a small additional amount of water does not appear to affect the energy. Development will often be complete in two minutes at 70 deg. Fahr. The formula works very well with roll films. Where shadow detail is required, and the plate is under-exposed, it may be necessary to push development to a stage when the high lights are blocked up, and if a soft printing paper gives too much contrast, reduction with ammonium persulphate may be necessary. In all other cases, the negatives when badly under-exposed should be kept as thin as will give a print on contrasty paper, as further development would probably give a grainy negative.

Some of the single solution developers give good results, and nice soft negatives if the under-exposure is not excessive. Several experimental methods of dealing with under-exposure may be mentioned. A minute exposure to light prior to use increases the apparent speed of a plate, but the very small amount of pre-exposure requires a precision outside the scope of most amateurs. Soaking the plate in a developer, and taking it out to continue development with the solution on the sensitive film has its advocates, the theory



Wm. Shewell Ellis.

being that those parts which are less exposed will not have exhausted the developer when the other parts have, so that shadow detail can proceed without the other parts being too far developed. The method is likely to cause aerial fog in the film when it is taken out of the dish, but soaking in a desensitizer prior to development is an effective remedy for this. Opinions differ as to the efficacy of this procedure, but some capable workers use it regularly.

I have once or twice obtained remarkable results by a very risky device. After the plate is nearly developed, it is exposed through the back to a light which is not quite safe—the shadows show slight reversal on further development, and this deposit serves in the place of the lacking detail. There is little to be said about the printing, except that few amateurs realize how thin a negative can be and yet yield a decent print, by the use of a weak printing light, a contrasty paper, and a minimum exposure. Every effort should be made to avoid intensification which always increases grain. If intensification is unavoidable, very slight uranium intensification is probably the best method.

Some times good prints can be made by over-printing and reducing with iodine dissolved in potassium iodide. The print when free from hypo is immersed in a weak solution until the whites begin to turn blue, when the print is immediately put in a clean hypo solution. The secret of success is to do the reduction by degrees, *i.e.,* successive immersions in the iodine and hypo, washing the hypo out thoroughly each time, but one cannot regard this method as by any means a certainty.

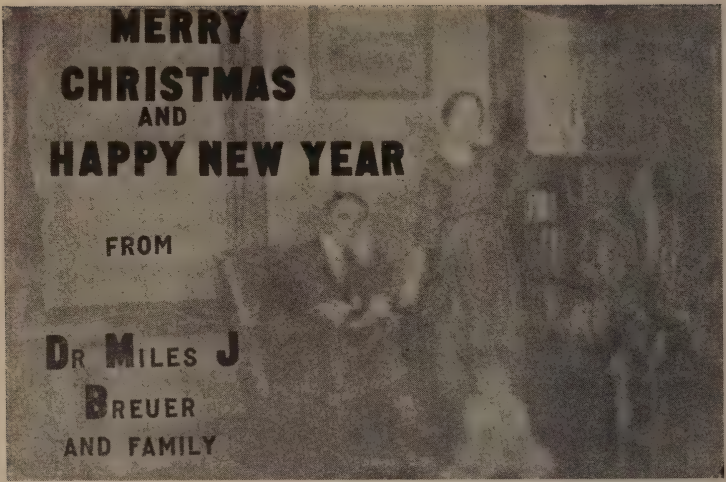


Figure 1.

Illustrating article "Photographic Holiday Cards," by Dr. Miles J. Breuer.

PHOTOGRAPHIC HOLIDAY CARDS

By DR. MILES J. BREUER

EVERY year I receive a large number of Christmas and New Year's greeting cards. So do you. They are engraved and enamelled; green and red and gold; embossed and gilt-and-bevel-edged; and have little conventional verses on them. They are works of art, and each new one is more beautiful than the last. You look at the name of the sender to see if you have not forgotten him on your mailing-list, and then you drop the card in a drawer or basket, and never look at it again. Also, you send out fifty or a couple of hundred, and the other fellow treats them about the same way. Taking them as a whole they are all about alike. The Christmas-greeting proposition is becoming a sort of wholesale business; you give your order, supply the mailing list, and your Christmas greetings are processed out for you by the factory machine method.

WILLIAM H. PHILLIPS.

To make the occasion a little more personal, and in the hope of making my greetings stand out among the others, I have for the past few years made Christmas greeting cards photographically. In the latter respect, at least, I have succeeded, if any value can be attached to the fact that people have stopped me in the street, or called me up on the telephone to tell me how they appreciated the originality and interest of the greeting card they received from me.

A greeting-card designed and made by the sender may lack by accurate standards the artistic and technical perfection of the admirable cards gotten out by skilled hands and highly developed machines. But, that is the very thing that makes the difference to the recipient. The personal note, the flavor of originality and individuality is far preferable to the knowledge that the card has been purchased over a counter, or ordered by the gross from a salesman. In addition to the satisfaction and interest which you know is felt by the recipient, there is a lot of pleasure in the designing and making of the cards for the person who does it.

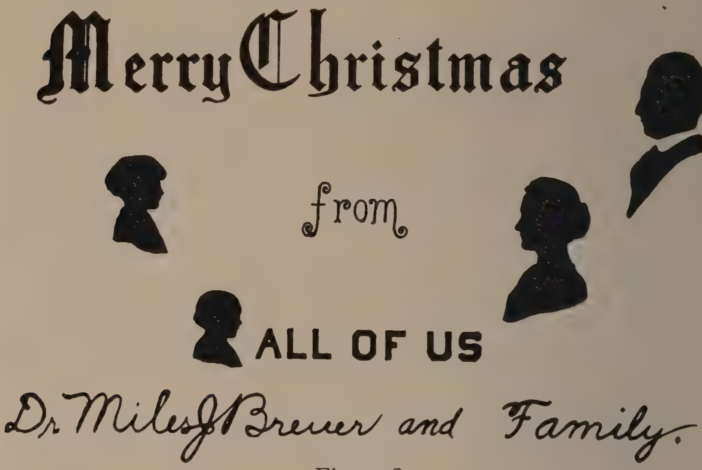


Figure 2.

The most difficult thing is to get the original conception. Once you have that, the working it out in the concrete is a matter of technical detail. The first card of all is the most difficult in that respect. After you have made several, ideas for others begin to suggest themselves while you are work-

RONAI DENES.

ing; things you see in books and journals suggest further ideas to you. The title-pictures in movie plays are especially suggestive of ideas, if you have this purpose in mind when you watch them. As the idea may not be utilized for months, it is not safe to trust to memory for the preservation of these inspirations. I keep a little notebook with the verbal notes and pencil sketches, and along about Thanksgiving time I dig this up and study out another card to send out.

One of the best ways to get started doing something new is to repeat someone else's previous efforts; and one of the best ways to entice inspiration for original conceptions, is to read of the other fellow's work along the same lines. That is why I am telling how I got some of my ideas for greeting-cards, and how I worked out these ideas. My first two or three efforts were confined to some conventional snow-scene, Santa Claus, and a conventional verse cut from the regular Christmas cards, arranged on a background, signed with my name, and photographed. I am not illustrating any of these, for they are but repetitions of the conventional cards.

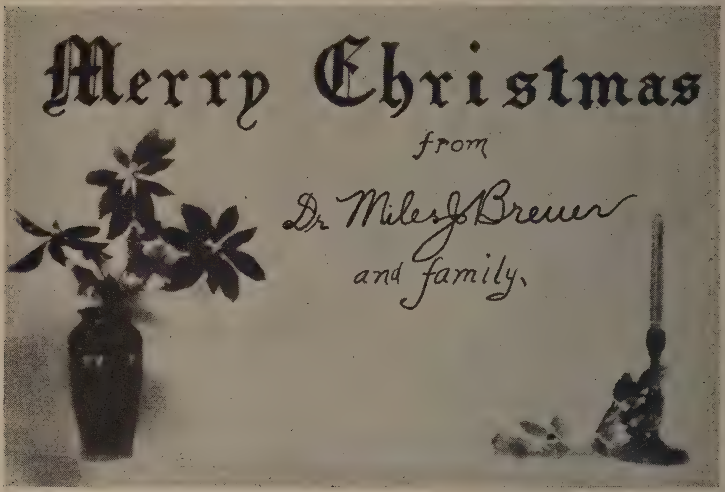
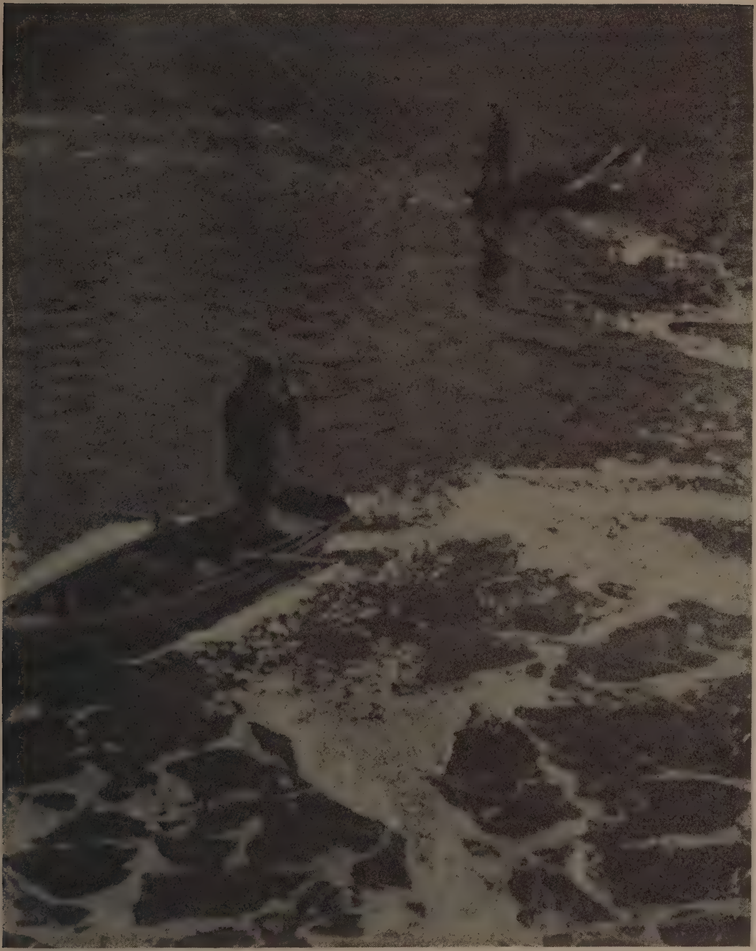


Figure 3.

It then occurred to me that the recipients of these cards would be interested in a picture that carried a personal message with it, and Figure 1 was the result. Our own faces in our own home was my first idea; yet I did not exactly want



FISHING. HIROMU KIRA.

it to be a portrait card; I wanted the holiday feature of it to stand out above the personal side. The Verito lens helped; our group was taken in the home, by means of a flashlight, and an enlargement of considerable diffusion was made. The lettering was done on the face of the enlargement, by means of the small adhesive letters supplied for sign work by office-equipment concerns. This was then copied with an anastigmat lens as sharply as possible, and from the new negative, the cards were printed.

Figure 2 was suggested by something I saw in some photographic journal long ago; I have not the least recollection of when it was, or what journal it was, and am, therefore, unable to make the proper acknowledgment. The silhouettes were made as follows. The heads were posed against a vertically suspended sheet, arranged by means of an electric light behind the sheet, and exposed by means of a flashlight behind the sheet. Care was taken to make them all to the same scale. I was not satisfied with the contrast in the prints, and therefore traced the outlines in india-ink, filled in the silhouette solid with india-ink on a water-color brush, and dissolved away

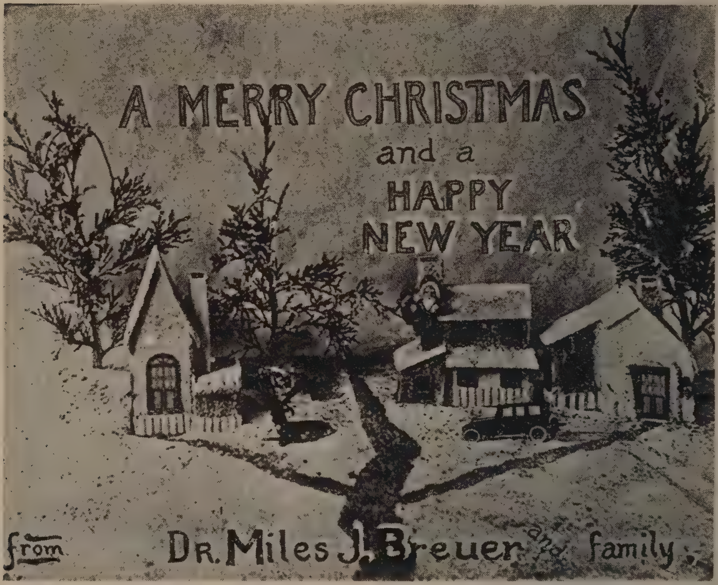


Figure 4.

MARGARET. J. W. AUGHILTREE.

the silver image by means of Farmer's reducer. The prints were then pasted on a sheet of cardboard, the lettering done free-hand, and a post-card sized negative made.

In Figure 3, I reverted to the conventional Christmas holiday design; but instead of copying someone else's design, I arranged the actual objects on a table, and photographed them. In making the still-life picture, I tried both soft-focus and sharp effects, and on looking over the prints, preferred the soft-focus appearance. The print of choice was enlarged to 11 x 14 inches, and the lettering done directly on the face of the enlargement in india-ink, free-hand. By copying this, the negative for printing the cards was obtained.

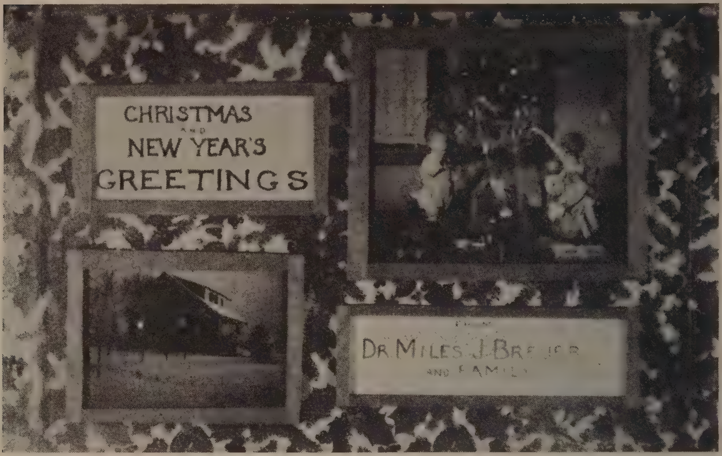
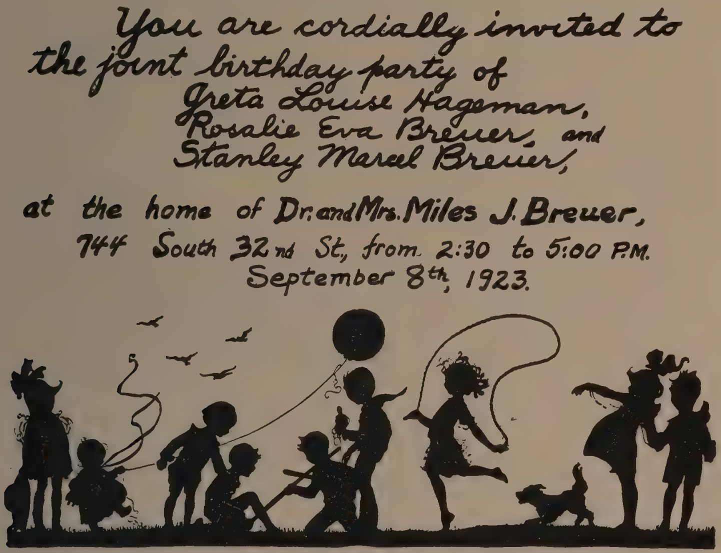


Figure 5.

Figure 4 is another still-life picture. The idea came to me while I was roaming through a ten-cent store, wondering what kind of a Christmas card to make this year. The little pasteboard houses suggested one at once. Three of them were enough to suggest an old German village, with a Santa Claus by the chimney of one of them, and a modern sedan to suggest that old Santa had improved upon his traditional method of transportation, while the freed reindeer is enjoying his liberty unafraid on the other side of the path. The reindeer is one of the little lead animals so common in the ten-cent stores. The automobile was cut out of a magazine and touched up with india-ink.

The slight incongruity in perspective does not bother us much in a picture of this sort. All these objects, and the little cedar twigs, were arranged on a board, which was covered with sand. The paths were first cut out of paper and laid down, and then the snowstorm was permitted to take place—out of a flour sifter. Then the paper paths were lifted up, leaving the uncovered sand beneath. A number of exposures were made, and the most satisfactory one enlarged; the enlargement lettered, and the copy-negative made in the usual way.



You are cordially invited to
the joint birthday party of
Greta Louise Hageman,
Rosalie Eva Breuer, and
Stanley Marcel Breuer,

at the home of Dr. and Mrs. Miles J. Breuer,
744 South 32nd St., from 2:30 to 5:00 P.M.
September 8th, 1923.

Figure 6.

Figure 5 is another effort to get personal, so to speak. The inset pictures show the home and the children that are well known to most of the recipients of our Christmas greeting cards, and show them the way they look at the time the card was received. The original pictures were taken on the preceding Christmas and kept a year for that particular purpose. The background is a piece of ordinary holly wrapping paper, and the lettering is done on pieces of card pasted on the background, the entire arrangement then being photographed. This card is probably the poorest from an artistic standpoint, but seemed to be the most popular one that we had ever sent, judging from what our friends said about it.

Christmas is not the only occasion for which photographic cards will serve. I am including Figure 6 just to show what can be done in the way of party invitations. The little fresco was clipped out of some children's magazine. We also announced the births of our two children by means of photographic postcards containing a picture of the baby only a few hours old. There are numerous other opportunities in making use of photography to inject a little originality in stale, conventional stuff, if one but watches for them.

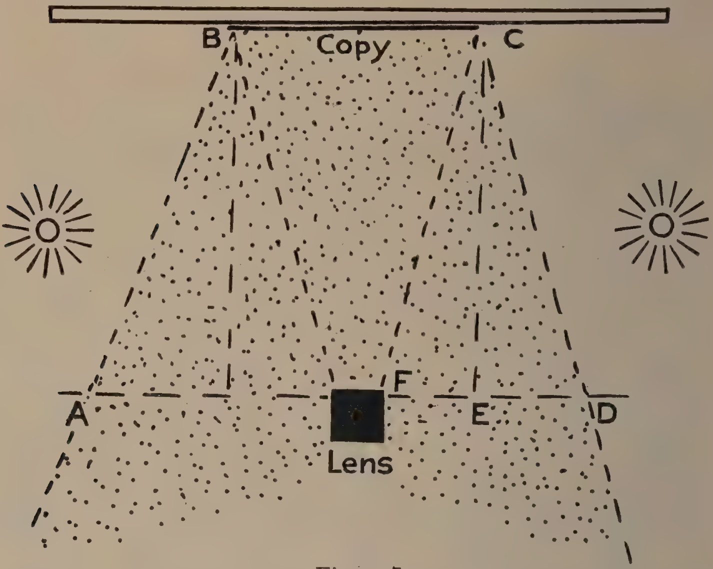
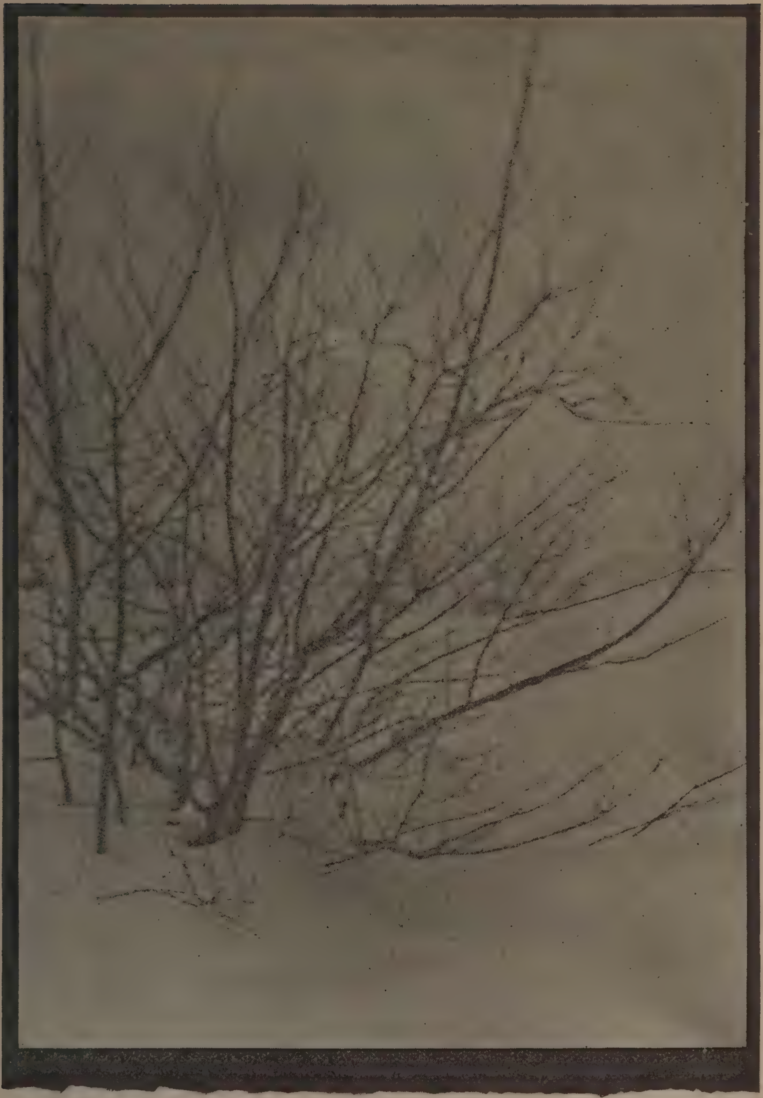


Figure 7.

Placing of illumination in copying. Angle of reflection ECD is equal to angle of incidence ECF. Dotted area is the area of reflection. Illumination may be placed anywhere outside the lines AB and CD.

Let me say a few words regarding technique. The illumination of still-life groups, and of the original drawings and enlargements is best obtained by means of a 400 candle-power Mazda bulb. The exposure for copying will be approximately two minutes, with an aperture of F/11, the light thirty inches from the subject, a reduction from 11 x 14 to postcard size, on a slow plate, either process or Seed 23. It is always advisable to make four to six exposures of different lengths,



WALTER H. CHENEY.

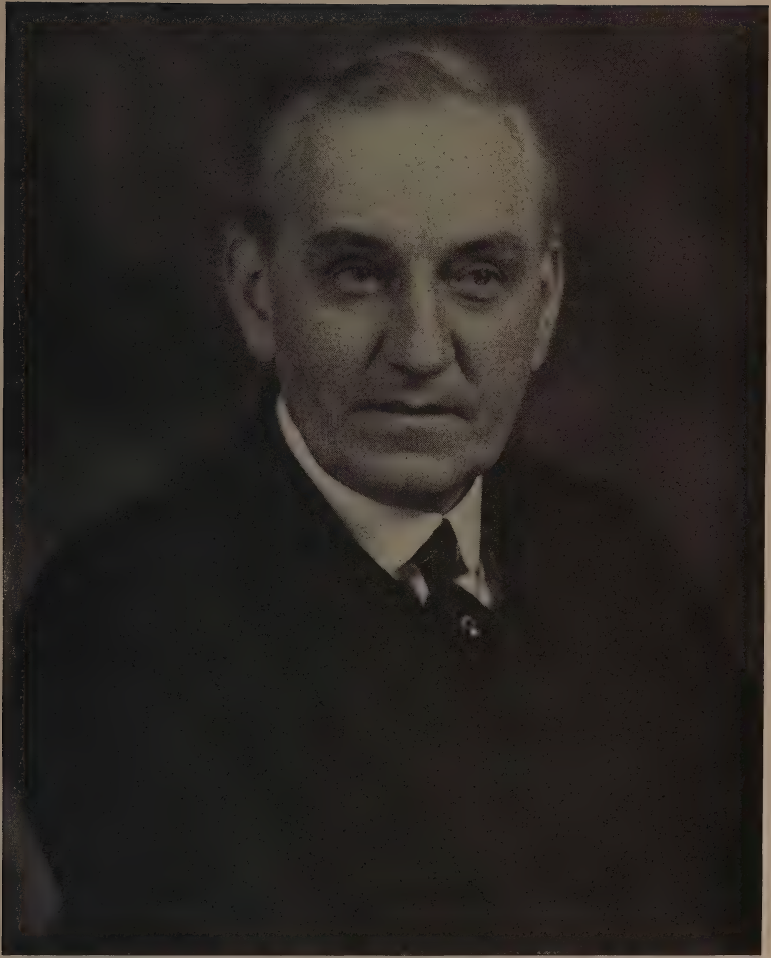
and then select the most satisfactory. To prevent reflections from the surface of the paper that is being copied, the light should not be held behind the camera, but at the side, outside the area of reflection, as illustrated by the sketch (Figure 7). Give half the exposure with the light held on each side.

When still-life is being photographed, or designs in color are being photographed, one never knows just what one is going to get in the way of color values. I gradually adopted the plan of making exposures on plain plates, orthochromatic with and without color filter, and panchromatic with a filter, and then selected the most satisfactory. Results vary; sometimes the plain plates give the best rendering; and again panchromatic plates are required.

The negatives of the final copy are best made on a slow plate; usually process plates give the best results, although a slow plate like Seed's 23 is very satisfactory. The exposure should be a minimum one. In case pure black and white results are desired, as in the case of the silhouettes, development should be generous, or intensification may follow development, with a very short original exposure time. In case of the latter, I have always found it necessary to block out portions of the negative with opaque paint in order to get a pure white. The negatives may then be printed upon a very contrasty grade of paper.

On the other hand, cards in which detail and gradation are desired may be given a slightly fuller exposure, should be developed slowly, and development should not be carried too far. I have usually done the printing myself; with a printing machine such as those sold for amateur use. Two or three hours have sufficed for the work.

As the dad of the family, I have often envied the ladies because Christmas has seemed to mean more to them. It means more because they spend weeks of work preparing for it, sewing and knitting things, and making things out of paper and paste and paint, and spending long hours doing things with their fingers for those they love. No wonder Christmas sometimes seems a little sordid to us, when all we do is to give an order and pay the bill. A little more of spending patient hours and doing things with the hands will bring back some of the old Christmas feeling into our rushed and nervous modern holidays.



EDMUND BURKE. FLOYD VAIL, F.R.P.S.

TOWING HER IN. ROBERT A. BARROWS.

NOTES ON DEVELOPING

By J. E. FOSS

CIRCUIT, or other large film, may be developed easily in a tray just large enough to take the width of the film by using A. B. C. Pyro developer, starting without any B. (Carbonate) in the solution, and allowing the film to roll up in one hand, while unrolling from the other, until the image is well formed. Then add the B. (Carbonate) until desired density is reached. This is also an excellent way to develop negatives so as to bring out clouds, but in these negatives, start development with a few drops of B. (Carbonate), and after image is well up, add a few drops at a time until detail in the shadows is reached.

PYRO FOR UNDER-EXPOSURES

The contrast that can be obtained with a Pyro developer, and the relative speeds with which the tones appear, depends

SHINKYO, NIKKO SHRINE. Y. Malony Kumazawa.

upon the composition of the developer and, consequently, when developing under-exposures, the composition of the developer must depend upon the character of the original subject. If the subject is contrasty, and we are required to get detail in the shadows, we should use double the amount of B. (Carbonate) and double the amount of water, since any excess of Pyro tends to retard shadow detail. Continue development until the shadows begin to fog. This treatment gives all the detail that Pyro developer is capable of, without excessive contrasts.

A small amount of 10 per cent Potassium Bromide may be added, and development prolonged without fog, as bromide only retards shadow detail in the early stages, and does not prevent the ultimate appearance of shadow detail, but does prevent fog.

OVER-EXPOSURES

Over-exposures, when known, may be dealt within the reverse, using an excess of Pyro and adding bromide 10 per cent solution, one (1) drop to every ten (10) of A1 Pyro solution; develop until proper contrast is reached.

If over-exposure is unknown before development starts, pour off all but enough of the solution to barely cover the plate when tray is tipped from corner to corner, and continue to develop until as much contrast as possible has been forced out. The free bromide of silver, released from the plate into the small amount of solution, acts as a restrainer, and does much more efficient work than can be obtained by adding bromide of potassium.

MAKING THREE-COLOR FILTERS BY DYE BATHING

By FREDERIC G. TUTTON, F.R.P.S.

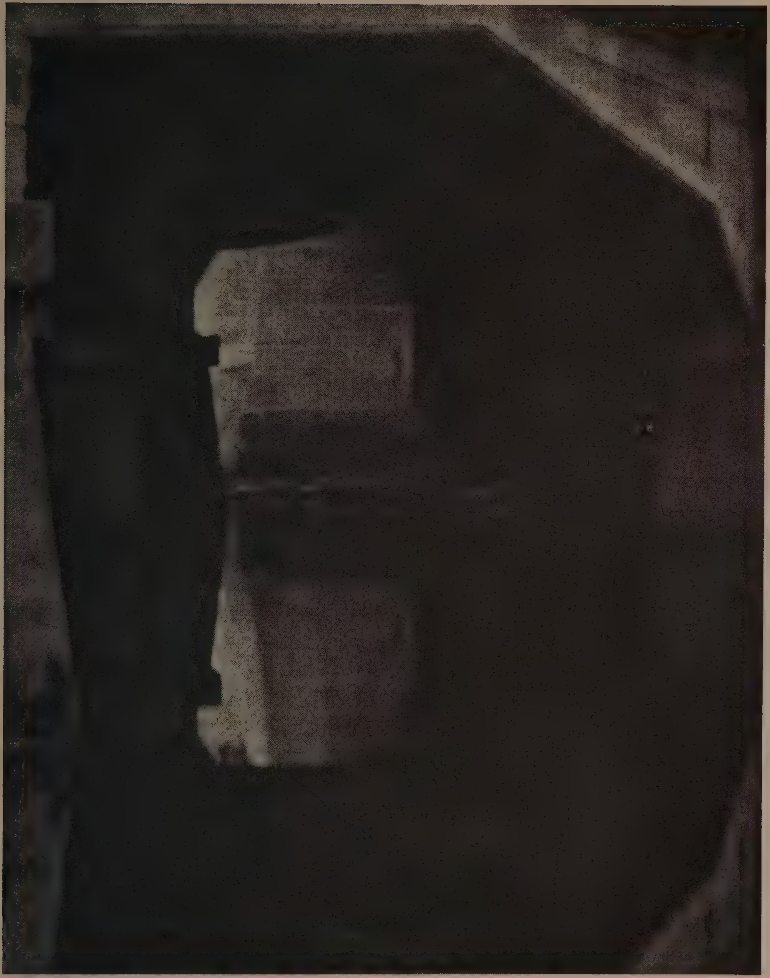
MANY THREE-COLOR photographers who have tried their hand at making a set of separation filters generally give up the attempt in disgust after wasting much material, time and temper, owing to the difficulty involved in obtaining a perfectly flat and even layer of gelatine, and the messy job involved in the final cementing.

To the experimentalist who is prepared to take a little trouble this paper is written. It will show a way in which a set of tri-color filters can be made by means of dyeing up a fixed out unexposed photographic plate. Now, most text books upon color photography give one the impression that making filters by dye-bathing is practically impossible, owing to the so-called difficulty of dyeing the gelatine evenly and drying marks forming thereon.

In the author's hands, however, such difficulties have *not* been met with, whole-plate and larger filters having been made with ease. If the following directions are carried out the filters will remain quite clear, free from drying spots, other markings, etc. It will also be found that such filters will give a correct spectroscopic cut, and will give a final colorprint equal to any produced by using the filters made by the manufacturers.

Select three undeveloped photographic dry plates of such size the finished negative is required, and as far as possible have the thickness of the glass for all three the same. Fix out in an ordinary hypo bath to which has been added a few drops of potassium ferricyanide, this to keep the gelatine clear and free from fog. When fixed they should be well washed for at least an hour in running water, then dried the usual way free from dust.

In preparing the bath, it must be understood that only dyes of a photographic purity will give the correct result. Dyes of ordinary purity are useless, as these will in some cases



UNDER THE BRIDGE.
(Bromoil)

HENRY A. HUSSEY.

give a color totally different to that required, while others give a correct visual, but not a correct spectroscopic color. The dyes manufactured by Famwerks, vorm Meister, Lucius and Bruning of Germany are recommended and used by the author.

The dye baths are made as follows:

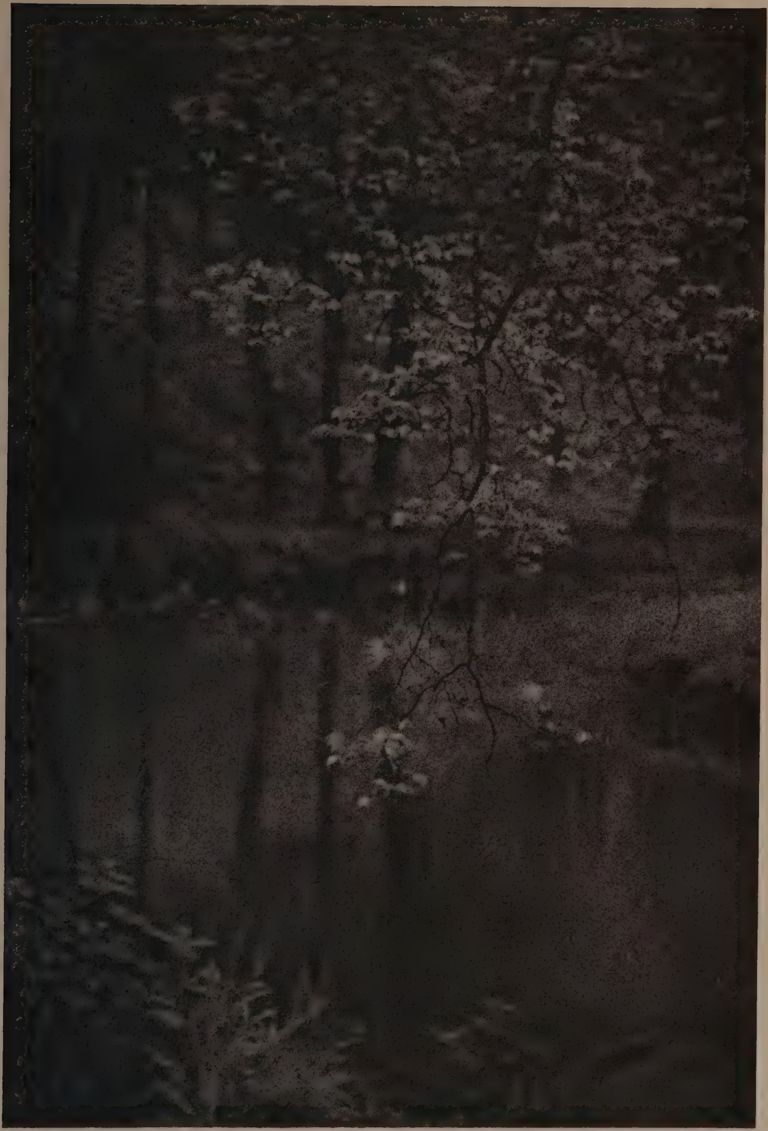
RED.	Tartrazine	10½	grains
	Crystal scarlet	3	grains
	Distilled water	1	ounce
GREEN.	New patent blue	4	grains
	Naphthol green	4	grains
	Tartrazine	5	grains
	Distilled water	1	ounce
BLUE.	New patent blue	12	grains
	Naphthol green	1½	grains
	Distilled water	1	ounce

These baths are used at the strength given, and each dried and fixed out plate is immersed in its respective color for *exactly ten minutes, i.e.,* one plate is used for the red, one for the green, and the other for the blue bath. It is advisable that one plate at a time be done, all vessels and dishes being thoroughly washed out and quite free from dye before proceeding with another color.

To get the best results it is essential to note that the strength of the baths must be adhered to, and the length of time of immersing the plate is important. A shorter time, and a stronger bath, will not give the desired depth to the filter, while a longer immersion in either the same strength bath, or a weaker one, will produce uneven markings.

One ounce of these dyes will be sufficient to color three quarter-plates, one at a time, and while the plates are being dyed up the dish containing the dye bath should be well rocked so as to prevent any foreign matter in the solution settling on the plate to cause spots, etc.

At the completion of the time of immersion the plate is removed from the bath and rinsed under a tap of running water to remove surface dye, then wiped over with a piece of damp cotton wool, from which all wet has been squeezed out, to remove surplus moisture. The plates are then dried as quickly as possible away from dust. The surface moisture should be removed as completely as possible, otherwise drying



C. J. SYMES, F.R.P.S.

marks resulting in uneven dyeing will take place. Needless to say the latter operation should be carried out with care to prevent scratching the film.

When all three color filters have been made and dried it now remains to determine their exposure ratio for the particular panchromatic plate being used. The easiest way of doing this is to make a chart on the same lines as Figure 1:

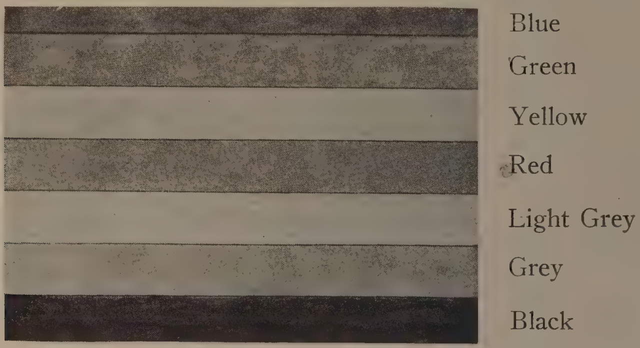


Figure 1.

with the colors blue, green, yellow, red, light grey, grey and black, running across in strips. The colors blue, green, yellow and red are not really essential for the success of the chart, but are put in so that the action of each filter upon any color may be noted.

A chart of this description is made and hung up in a place away from direct sunlight. Each panchromatic plate and filter is placed together in the dark slide with the filter facing the lens. It is immaterial whether the gelatine of the filter is next to the panchromatic plate or not, but for the sake of keeping this free from scratches it is recommended that the dyed gelatine be in contact with the plate. In focusing upon any subject allowance must be made for the thickness of the filter glass, and the back of the camera brought nearer to the lens a corresponding allowance.

To arrive at the filter ratio, however, a step exposure is made of this chart through each of the three filters, and the plates developed together. When dried the density of the grey and black strips only on the three plates as compared and those which give a corresponding, or same, density will show the ratio number for each filter.

STEPS BY MOONLIGHT. ELEANOR L. SMITH.

It is, of course, quite impossible to give definite figures for this, as these will vary according to the make of panchromatic plate used; but from the following particulars the experimentalist should be able to determine his own ratio factor. Using Ilford's special rapid panchromatic plates, a step exposure through the red filter was made with the following multiplying ratios: 10, 14, 18, 22. Figure 2 gives a print from the negative:

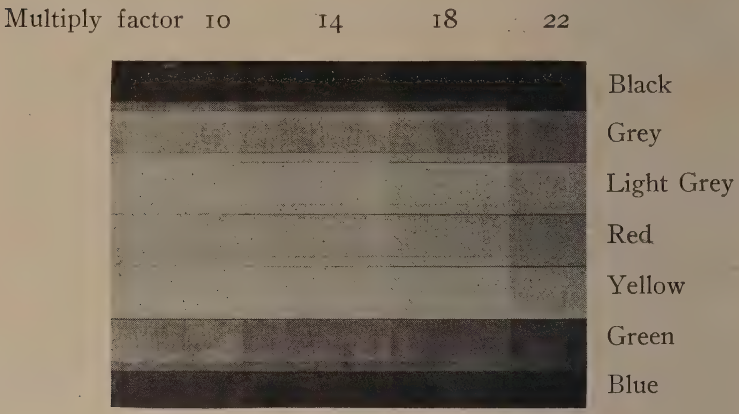


Figure 2.

Then the green filter was exposed with a ratio of 18, 22, 26, and 30, giving a print as Figure 3,

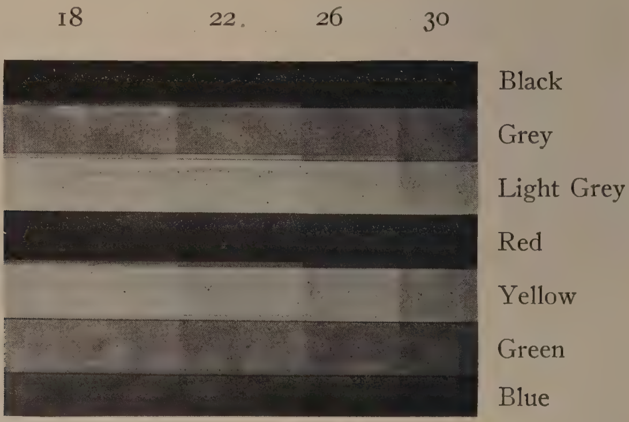


Figure 3.

WINDSWEPT. Leon Jeanne.

while Figure 4 represents a step through the blue filter with 14, 18, 22, and 26 as the multiplying ratio,

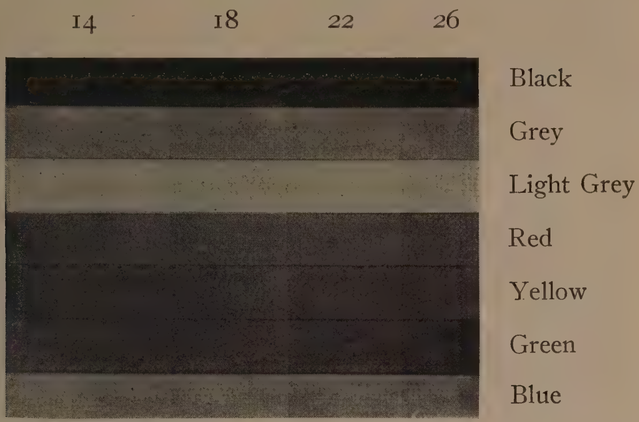


Figure 4.

It will be seen that the ratio for red 14, green 18 and blue 26, give the grey and black step practically identical in density, resulting in these numbers being used as the multiplying factors upon all occasions when these filters and panchromatic plates are used.

STILL LIFE. GUY SPENCER.

GARDEN OF THE GODS. A. E. RUTENBECK.

FAR DISTANT LANDSCAPES

By L. B. CARLSON

IN distant landscape work we are confronted by the problem of recording enough contrast between the tones of far distant objects to make them clearly visible in the picture. The farther away the objects are the less contrast we can see between them and their surroundings; and, since it is contrast that we need, it is obvious that the best pictures can be made when sunlight can be seen in contrast with shadows on the distant parts of the landscape, at times when the distance is not obscured by haze.

Under such conditions pictures that will show contrast between the objects in the distance often can be secured, without using a color filter, by merely giving one-half as long an exposure as would be needed for ordinary landscape scenes

A HAZY MORNING IN THE CATSKILLS. A. C. G. ALLISON.

that contain foreground objects in which it is desired to record detail.

The most common difficulty that is encountered in distant landscape photography is, however, one that cannot be eliminated by shortening exposure, as this difficulty is caused by the haze which is so often visible in the distance.

At all but high altitudes the air usually contains minute particles of dust and water vapor. On a clear day the quantity of dust and vapor suspended in the air that is between the camera and objects that are a few hundred feet away is too small to be noticed, but the quantity that is suspended between the camera and objects that are a mile or more away, is often sufficient to make it impossible for us to see the far distant objects clearly.

If the haze is of a bluish color it consists very largely of water vapor, the particles of which are transparent for all of the colors of which white light is composed, excepting the blue-violet. The effect which such minute particles have on the blue-violet is to reflect and scatter it. Since all films and all plates are more sensitive to the blue-violet, than to any other color, the only way that we can photograph through a bluish haze is by using a filter that will absorb some, or all of the blue-violet; that is, a filter that will prevent all or a part of it from reaching the film.

The distinctness with which far distant objects that are obscured by haze can be recorded in a photograph when a filter is used, depends on how much of the blue-violet is absorbed by the filter. The greater the absorption the more distinctly they will be rendered, and, as a consequence, the nearer to the foreground they will seem to be in the picture.

It is because of this latter effect, the apparent lessening of the distance between the nearby and the far away objects, that we should not use a filter which absorbs nearly all of the blue-violet, unless we want the distance to be rendered with the utmost clearness, or unless the far away objects are wholly obscured by a bluish haze.

The writer prefers to use a Kodak Color Filter when a blue haze slightly obscures the distance, a Wratten K2 Filter when a haze considerably obscures the distance, and a Wratten G Filter when the distance is wholly obscured by haze. The Kodak Color Filter absorbs all of the ultra violet and

MOUNT SHUKSAN.

EDWIN FRANKLIN DREHER.

THE SENTINEL. A. E. RUTENBECK.
NORTH CHEYENNE CANON.

most of the violet. The Wratten K2 Filter absorbs all of the ultra violet, all of the violet, and nearly all of the blue. The Wratten G Filter absorbs all the ultra violet, all of the violet and nearly all of the blue. The Kodak Filter will, therefore, add the least, and the G Filter the most, contrast to the picture.

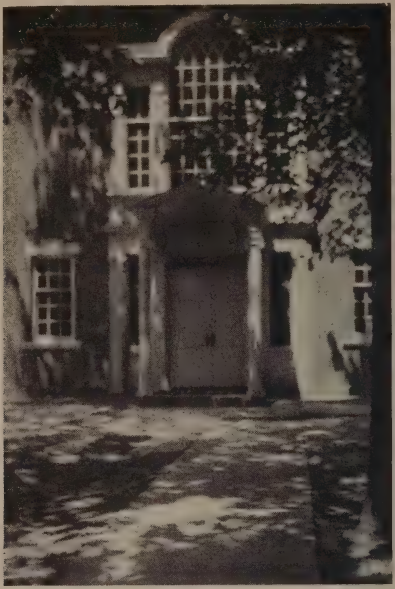
Since filters absorb some of the colors to which films and plates are especially sensitive, they necessitate an increase in exposure. The number of times the exposure must be multiplied is called the filter factor. When Kodak film is used the factor for the Kodak Filter is 7. For the Wratten K2 it is 20, and for the Wratten G it is 100. These factors are calculated for exposures that will record shadow detail. Since in distant landscape work contrast between the tones of far distant objects is of much greater importance than shadow detail in nearby ones, many workers prefer to use 3 as the factor for the Kodak Color Filter 10 for the K and 50 for the G.

The exposures that are recommended for distant landscapes

PALMS OF THE COLORADO DESERT.

Copyright by
STEPHEN H. WILLARD.

when no filter is used are: With cameras that have rectilinear or anastigmat lenses, 1/50 of a second with stop 16. With single lens folding cameras, 1/25 of a second with stop 3. With single lens fixed focus box cameras, a snapshot with the next smaller stop than the one that is used for ordinary snapshot work.



SUN SPLENDOR. HAROLD W. COLE.

JEAN AND TIMMY. MILDRED RUTH WILSON.

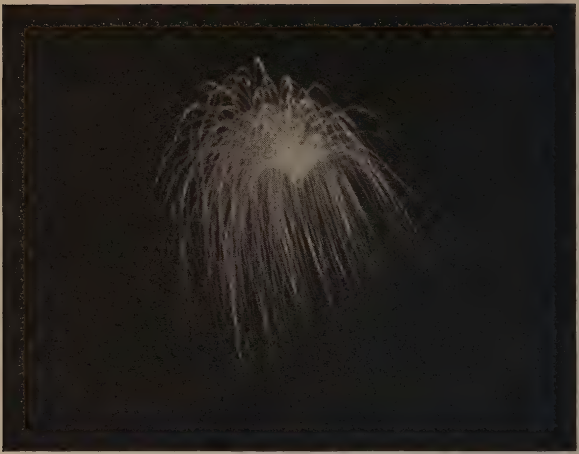


Figure 1.
Illustrating article "Fireworks Photography," by William P. Sipes.

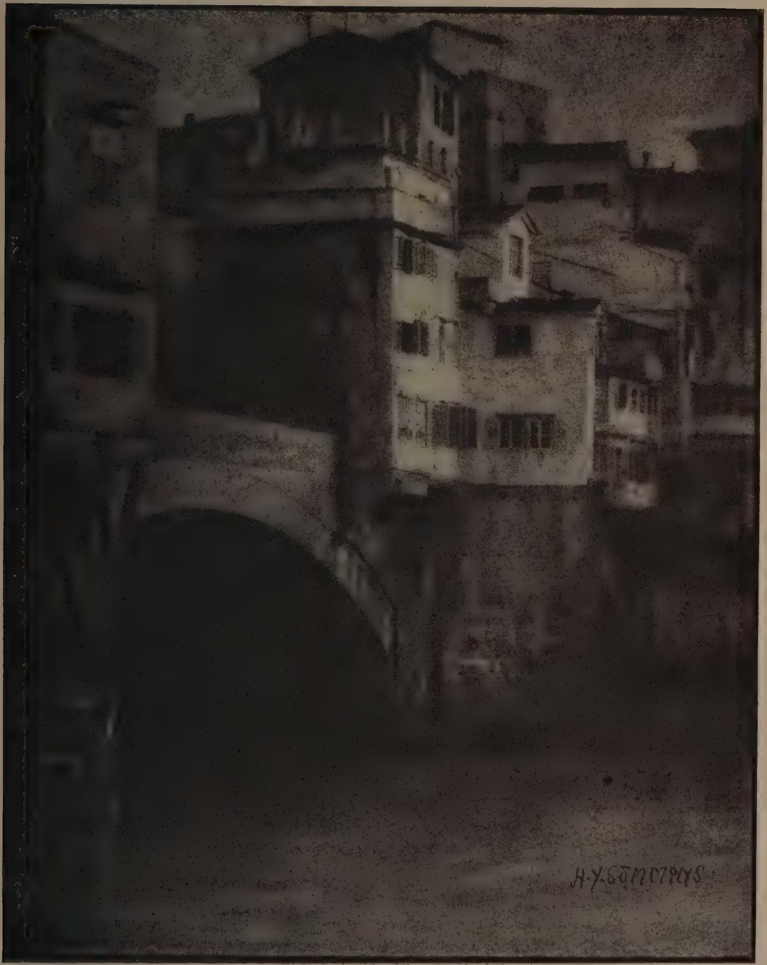
FIREWORKS PHOTOGRAPHY

By WILLIAM P. SIPES

NO branch of photography is so little practiced as night fireworks. And yet it is open to anyone having a small folding camera or kodak. My own beginning in this branch of work was met by many obstructions, but by overcoming these step by step I have now worked a system whereby anyone can secure splendid results.

The camera best suited is the folding type, such as a kodak, having view-finders and focusing scale—and a lens working at F/7.7 or F/8 or U. S. 4. Your camera or kodak should have a view-finder. As it is night while taking this kind of a picture, it is difficult to tell if what you see in a finder is in the field of view. These finders are in the cross shape—for horizontal and vertical positions. You will use the vertical position on all, except large set pieces and illuminated airplane flights.

Take a small piece of adhesive plaster tape, cut a little



H. Y. SUMMONS.

longer than opening in view-finder. Cut narrow strips and place over the two sides on view-finder, leaving only the opening that will show for a picture in a vertical position. You can see now just what will show in the picture. Set your focus at 100 feet, and your lens stop at F/7.7 or F/8, or U. S. 4. As only time exposures can be taken, you will need something to hold the camera steady. I used a tripod at first, spreading two (2) of the legs out in the rear, and the other one pointing out in front, but drawn back, as your camera is pointed upward while the front leg is so placed. I moved it forward or backward and to either side as the case required. Unless you have a smooth surface under you, this method has its faults; it may tilt forward or to one side—thus cutting out an important part of the picture. I have used a cigar-box, setting it on the ground, and with my right knee bent flat before me, the box in front of it, I tilted the camera to about 45 degrees, by moving the bottom back and forth.

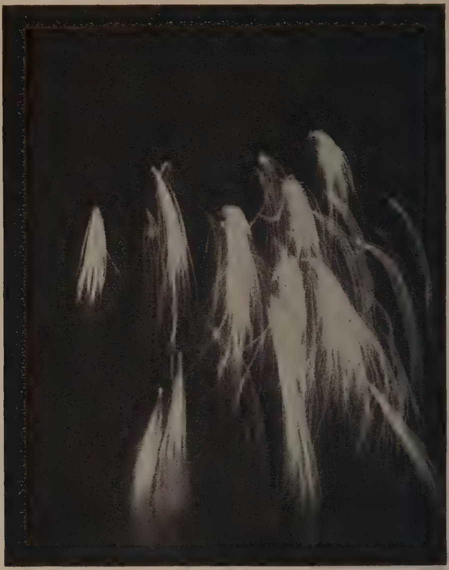


Figure 2.

But the method I now use, and which I find superior to all others, is a metal tripod—on this I use an Eastman optipod. This works on a ball and socket, and is locked in any position

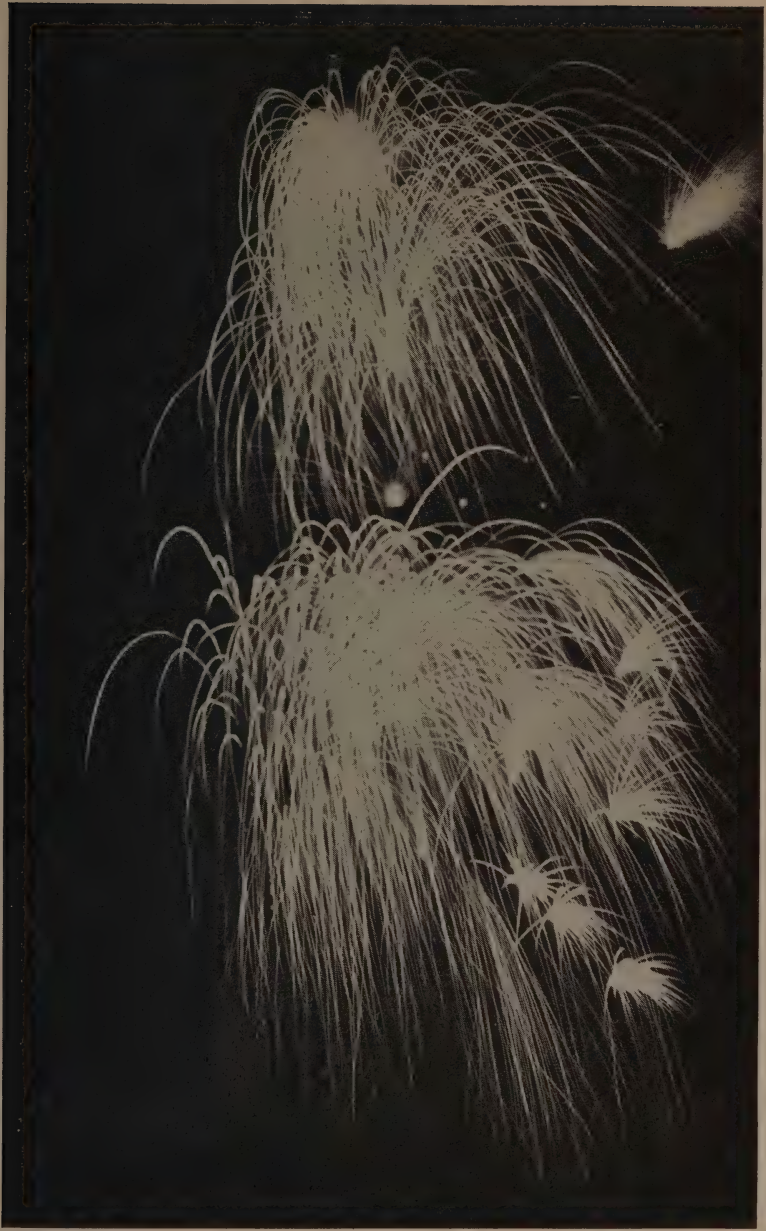


Figure 3.
Illustrating article "Fireworks Photography," by William P. Sipes.

by a large thumb nut. A quarter turn of this nut will permit one to move, or point, camera in any direction desired.

Screw the optipod on tripod. Screw the camera on it in the same manner as you would work a tripod-screw. Turn tripod around until the thumb-screw is on left-hand side. You will use left hand for tightening this. Loosen this and point camera in front of you, facing the spot where fireworks are to be set off. Next, take your cable release, or bulb, in your right hand, placing same between first and second finger, as in making all exposures, but further back, about where the second finger joint is. While cable or bulb is resting between your fingers, grasp the kodak bed, placing thumb on top and fingers underneath.

Now, by a quarter turn of the nut in your left hand you can tilt kodak at any angle upward. Do not untighten the binding screw more than to permit the kodak to be moved freely. Watch where fireworks are set off. The shell will be shot into the air. But there is always a burning fuse attached, watch for this with the eye, and as soon as you see one, locate it in your view-finder, as it moves upward move your kodak up also, keeping the lighted fuse about two-thirds of distance, up from bottom. When shell explodes the fire will drop downwards.

Success or failure depends on your next operation. As soon as you see the shell begin to burst open in view-finder, give the thumb-screw a quick gentle turn to lock it into position. The kodak must not be jarred while locking it, or it will blur and give a wavy effect in picture. As soon as it is locked take right hand off of the bed, and press cable or bulb. Your shutter should be set at "B" or bulb. Hold this open until the fire has died out.

You must be quick in locking your thumb nut and opening shutter. If you are sitting on the ground, you can use a brick or a small box, wrap them with paper to avoid scratching. As the shell goes upward slide the bottom of camera away from you, letting back rest on the block behind it. As soon as shell begins to open proceed as above in opening shutter. If using a tripod without the optipod locate the shell by its burning fuse in finder. It is much better to do this before it gets too high, as you can follow its progress upward and center it better in view-finder.

THE CIRCLE. WILBUR E. TAYLOR.

All colors will not photograph. So it is to be expected you will get some blanks. All large gatherings and State Fairs are putting on displays of this kind, and as so little has been known of this work in the past, it will be possible for anyone to take good pictures if you follow instructions.

The best point of view is in front, or on one side about three hundred feet from where fireworks are shot off. Many pretty effects are obtained, and because they are out of the usual in pictures, it makes it worth one's time in taking them. A small pocket flashlight is ideal to locate film numbers in window on back of kodak while winding film.

Figures 1, 2, 3 and 4 demonstrate what can be accomplished by the method described.

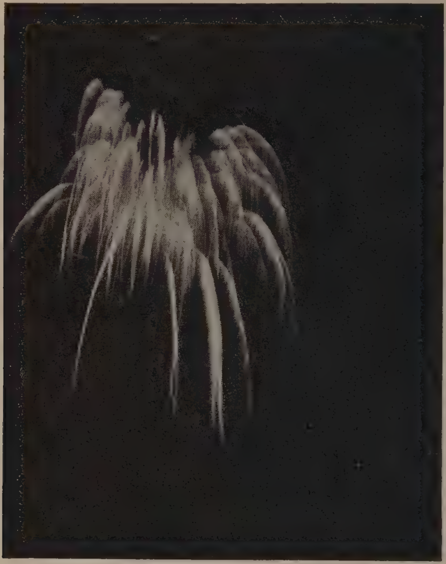


Figure 4.
Illustrating article "Fireworks Photography," by William P. Sipes.

American Annual Formulary

In the following section we have gathered together a typical collection of Formulæ and Tables, which will assist the photographer in his every-day work. It will be noticed that makers' formulæ are omitted. These can best be obtained by direct application to the makers. The appended formulæ are selected from the working methods of practical photographers.—Editor.

TANK DEVELOPERS FOR NEGATIVES

Elon-Photol-Pyro (A. L. Decker) (For deep tank development). Warm water, 32 ounces; Elon, 40 grains; Photol, 40 grains; Sodium Sulphite (Anhydrous), 2 ounces; Hydrochinone, 100 grains; Sodium Bisulphite, ¾ ounce; Potassium Bromide, 5 grains; Sodium Carbonate (Anhydrous), 1¼ ounces; cold water to make 1 gallon; add Pyro, Crystals 80 grains.

Metol-Hydro (Frew).—Water, 12 ounces; metol, 7½ grains; sulphite soda (anhydrous), 274 grains; hydroquinone, 30 grains; carbonate soda (anhydrous), 150 grains; bromide potassium, 2 grains. For use to each ounce of above add 4 ounces of water; temperature, 65 degrees; time, 12 minutes.

Monomet-Hydro-Pyro (John Boyd).—Monomet, 4 grains; hydroquinone, 4 grains; pyro, 4 grains; metabisulphite potassium, 4 grains; carbonate of soda, anhydrous, 40 grains; sulphite of soda (anhydrous), 60 grains; bromide of potassium, 1 grain; water, 4 ounces. For tank development use 28 ounces of water. Development, 20 minutes at 65 degrees.

Pyro (George D. Jopson).—No. 1. Water, 16 ounces; metabisulphite of potash, 70 grains; pyro, 1 ounce; bromide potassium, 8 grains. Mix in order given. No. 2. Sulphite soda (anhydrous), 60 degrees test. No. 3. Carbonate soda (anhydrous), 40 degrees test. To use, mix 2½ ounces of No. 1, 2 and 3 in rotation, add 57 ounces of water. Develop 20 minutes at 65 degrees.

Rodinal or Activol.—Water, 60 ounces; rodinal or activol, 1 ounce; temperature, 65 degrees; time, 25 minutes.

TRAY DEVELOPERS FOR PLATES AND PAPERS

Amidol. (W. M. Keck).—Amidol, 20 grains; sodium bisulphite (anhydrous), 40 grains; sodium sulphite (dry), 60 grains; potassium bromide (powdered), 1 to 3 grains; water, 4 ounces. For all kinds of developing paper. Expose so that the development will be complete in twenty to thirty seconds. The tone is a blue black.

Amidol Universal Developer. (W. A. Alcock).—Water, 20 ounces; sulphite of soda (anhydrous), ¾ ounce; amidol, 50 grains; potassium bromide, 10 grains; citric acid, 20 to 40 grains. Splendid developer for papers intended for bromoil. Expose so that the image first shows in thirty seconds and develop for four minutes. Gives good tones in hot or cold hypo alum, and nice soft negatives. Splendid in hot weather as it minimizes danger of frilling owing to lack of carbonate.

Adurol. (Hauff). (Anson Herrick).—25 grains; sodium sulphite (anhydrous), 190 grains; hydrochinon, 40 grains; sodium carbonate (anhydrous), 200 grains; potassium bromide (saturated solution); 15 minims; water, 20 ounces.

Diamidophenol. For Paper (Edwin Loker).—Water, 20 ounces; sodium sulphite (anhydrous), 1½ ounces; sodium bisulphite, 10 drams; bromide potassium, 10 grains. To use, take 2 ounces and add 6 grains diamidophenol.

Ferrous Oxalate. For Papers (M. G. Lovelace).—No. 1. Hot water, 1000 CC. Dissolve ferrous sulphate, 250 grams; add slowly sulphuric acid, 3 CC. No. 2. Potassium oxalate (neutral), 250 grams; potassium bromide, 1 gram; hot water to make 1000 CC. Add 1 part of No. 1 to 4 parts of No. 2. After development wash in acetic acid stop bath.

Hydroquinone. (Max Gartner).—Solution No. 1. Water, distilled, 20 ounces; hydroquinone, 160 grains; sodium sulphite (anhydrous), 2 ounces; citric acid, 60 grains; potassium bromide, 40 grains. Solution No. 2, water, distilled, 20 ounces; caustic soda (sticks), 160 grains. For use take No. 1 one part, No. 2 one part, and water two parts.

Hydrochinon.—For over-exposure plates to obtain contrasty negatives (B. H. Allbee).—No. 1, water, 8 ounces; sulphite of soda (anhydrous), ½ ounce; hydrochinon, 80 grains. No. 2, water, 8 ounces; carbonate of soda (anhydrous), 1 ounce; potassium bromide, 40 grains. Take equal parts of No. 1 and No. 2. Temperature, 70 degrees.

Metol (H. W. Hales).—Metol, 60 grains; warm water, 16 ounces; sulphite of soda (anhydrous), ½ ounce; carbonate of soda (anhydrous), ½ ounce. Dissolve metol in warm water, then add the sulphite and carbonate in order named. Cool. Can be used repeatedly. For developing papers add a few drops of 10 per cent solution of bromide of potassium.

Metol-Hydroquinone for Orthochromatic Plates.—Water, 20 ounces; metol, 14 grains; potassium metabisulphite, 18 grains; hydroquinone, 56 grains; sulphide of soda (anhydrous), 1 ounce; carbonate of soda (anhydrous), 1¾ ounces. Use 1 drop of a 10 per cent potassium bromide solution to each ounce only if necessary.

Metol-Hydrochinon. (Lloyd L. Snodgrass).—Water, 1.0 liter or 30 ounces; metol, 1.6 grams, or 22½ grains; sodium sulphite (anhydrous), 240 grams or ¾ ounce; hydrochinon, 6.6 grams or 90 grains; sodium carbonate (anhydrous), 24.0 grams or ¾ ounce. For use dilute with equal quantities of water. Add potassium bromide as needed.

Metol-Hydroquinone. For Paper (M. Gartner).—Water, distilled, 3 ounces; metol, 15 grains; sulphite of soda (anhydrous), 1 ounce; hydroquinone, 60 grains; sodium carbonate (anhydrous), 6 drams (for contrast use 1 ounce); bromide of potassium, 5 grains. Dilute this stock solution with an equal amount of water.

Developer for Commercial Work. (Max Gartner).—Water, distilled, 100 ounces; Ortol, ½ ounce; hydroquinone, 2 ounces; sulphite of soda; (anhydrous), 8 ounces; carbonate of soda (anhydrous), 12 ounces; bromide of potassium, ¼ ounce. For plates use full strength.

Para-Amidophenol. (M. G. Lovelace).—Dissolve 150 grains sulphite soda (anhydrous) in 800 CC. hot water; add 20 grains para-amidophenol; dissolve 8 grains lithium hydrate in 100 CC. water, and add until precipitate formed is dissolved; then add water to make 1000 CC.

Pyro. For Prints (M. G. Lovelace).—No. 1 Pyro, 12 grains; sulphite soda (anhydrous), 80 grams; potassium ferrocyanide, 2 grams; water, 500 CC. No. 2 Sodium hydrate, 4 grams; water, 500 CC. To use, one part each with water 2 parts. Add 3 drops saturated solution bromide of potassium to every 400 CC. of developer.

Pyro. For Night Subjects (Robert Dykes).—Stock solution—Pyro, 1 ounce; potassium bromide, 60 grains; potassium metabisulphite, 50 grains; distilled water to make 12 ounces. No. 1. Take stock solution 3 ounces, add 2 ounces boiled water. No. 2. Sulphite soda (anhydrous), 1 ounce; carbonate soda (anhydrous), 1 ounce; water (boiled) to make 20 ounces. For use, 4 drams No. 1 to 5 drams No. 2 in 16 ounces of water.

Pyro. For Overtimed Plates (J. D. Elliott).—Sulphite soda (anhydrous), 40 degrees solution, 4 ounces; water, 4 ounces; pyro, 10 grains. Immerse plates in this solution for 20 minutes in the dark; then add to above solution ½ dram carbonate soda (anhydrous), 20 degrees solution. When image appears add one more dram of the carbonate soda solution.

Pyro Tray Film Developer. (J. E. Carson).—No. 1 solution, boiled water or rain water, 8 ounces or 240 C.C.s; potassium metabisulphite. 60 grains or 3.55 grams; pyro, 120 grains or 7.10 grams. No. 2 stock solution; boiled or rain water, 8 ounces or 240 C.C.s; sulphite soda anhydrous, 328 grains or 21½ grams; carbonate soda, 219 grains, or 14¼ grams. For developing use half ounce or 15 cubic centimeters of each solution, and 4 ounces or 120 C.C.s water. Develop for five minutes at 65 degrees.

Pyro-Metol. For plates (H. M. Long).—A. Water, 22½ ounces; metabisulphite, 2 drams; metol, 60 grains; pyro, 1 ounce. B. Water, 16 ounces; sulphite soda (anhydrous), 2 ounces. C. Water, 16 ounces; carbonate soda (anhydrous), 1 ounce. Normally used 1 ounce of each stock to 16 of water.

DEVELOPERS FOR LANTERN SLIDES

Hydroquinone (B. H. Allbee).—No. 1. Hydroquinone, 150 grains; metabisulphite potash, 10 grains; bromide potassium, 50 grains; water, 20 ounces. No. 2. Sulphite of soda (anhydrous), 1 ounce; caustic soda, 100 grains; water, 20 ounces. Take equal parts of No. 1 and No. 2.

Hydroquinone. One Solution for Warm Tones (A. H. Farrow). Hydroquinone, 1 dram; sulphite of soda (anhydrous), 2 drams; carbonate of soda (anhydrous), 4 drams; bromide of potassium, 20 grains; water, 12 ounces.

Hydroquinone. For Colder Tones (B. H. Allbee).—No. 1. Hydroquinone, 60 grains; sulphite of soda (anhydrous), 1 ounce; citric acid, 10 grains; bromide potassium, 10 grains; water, 10 ounces. No. 2. Carbonate of soda (anhydrous), 1 ounce; water, 10 ounces. Use equal parts.

FIXING BATHS AND HARDENERS

Fixing and Hardening Bath. For Plates, Films and Papers. (W. A. Alcock).—In hot weather, hypo, 1 pound; epsom salts, 1 pound; water, 100 ounces. In cold weather, hypo, 1 pound; epsom salts, ½ pound; water, 100 ounces.

Acid Fixing Bath (W. Wynne Bolton).—Water, 80 ounces; hypo crystals, 24 ounces; sulphite of soda crystals, 8 ounces; alum (chrome), 4 ounces; acetic acid, 6 ounces. Dissolve chemicals in order named. Will keep from three to six months in a cool place to use over and over.

Acid Fixing Bath (Carbutt).—Sulphuric acid, 1 dram; sodium hyposulphite, 16 ounces; sulphite of soda (anhydrous), 2 ounces; chrome alum, 1 ounce; warm water, 64 ounces. To prepare the bath, dissolve the hypo in 48 ounces of water, the sulphite of soda in 6 ounces; mix the sulphuric acid with 2 ounces of the water and pour slowly into the sulphite solution and then add to the hypo solution. Dissolve the chrome alum in 8 ounces of water; add to the bulk of the solution and the bath is ready for use.

Fixing Bath for Lantern Slides (B. H. Allbee).—Sulphuric acid, 1 dram; hypo, 16 ounces; sulphite of soda (anhydrous), 1 ounce; chrome alum, 1 ounce; water, 64 ounces.

Plain Fixing Bath.—Dissolve 1 pound of sodium hyposulphite in 2 quarts of water, or 4 ounces of the hypo in a pint of water, according to the bulk of the solution required.

Hardener for Fixing Bath (Beach).—Water, 40 ounces; sulphite of soda (anhydrous), 3 ounces; powdered alum, 16 ounces; acetic acid, 40 ounces. Add in the order given and shake well until dissolved. Of the above add 16 ounces to each gallon of hyposulphite of soda solution, testing 70 to 80 degrees.

Hardening Negatives.—Immerse them for a few minutes in formalin, 1 ounce; water, 30 ounces.

Short Stop removes developer stains; renders an acid fixing bath unnecessary when making D. O. P. or bromide prints, and destroys stains on both prints and fingers. (J. E. Carson).—Potassium metabisulphite, 1 ounce or 30 C.C.s; water, 32 ounces, or 960 C.C.s. When thoroughly dissolved add 10 drops C. P. sulphuric acid. This bath should have a light sulphur dioxide odor after standing awhile. If not, add acid drop by drop until odor appears.

INTENSIFICATION

Intensifier, One Solution (F. M. Steadman).—No. 1. Bichloride of mercury, ½ ounce; water, 10 ounces. No. 2. Iodide of potassium, 5 drams; water, 1½ ounces. Add to No. 1. No. 3. Hyposulphite of soda, 1 ounce; water, 2½ ounces. Add to the previous mixture. This clears the solution when it is ready for use for local intensification. For tray intensification add more water to slow its action.

Intensifying with Red Ink (E. M. Cohen).—Soak the negative well. Put teaspoon of red ink into tray of water and rock until mixed. Immerse negatives face up till well and evenly colored, then without washing put in drying frame. If left in solution too long will be over dense, in which case several trays of clear water will eliminate some of the color.

The intensification is permanent without the danger of negative going bad, as is the case when mercury is used.

Intensifier—Mercuric Chloride Process.—No. 1. Mercuric chloride, 200 grains; bromide of potassium, 120 grains; water, 6½ ounces. No. 2. Sulphite of soda (anhydrous), 1 ounce; water, 4 ounces. The well-washed negative, free from hypo, must be thoroughly bleached in No. 1; well washed; and then blackened in No. 2. After blackening, it is well washed again.

Intensifier. (Monckhoven's).—A. Potassium bromide, ¾ ounce or 25 grams; bichloride of mercury, ¾ ounce or 25 grams; water, to 32 ounces or 1 liter. B. Potassium or sodium cyanide, ½ ounce or 25 grams; silver nitrate, ¾ ounce or 25 grams; water, to 32 ounces or 1 liter. In making up the intensifier the B solution requires care and must be made as follows: The cyanide and the silver are dissolved in separate halves of water, and the silver solution is then added to the cyanide solution until the precipitate formed no longer dissolves; that is to say, there must be a little precipitate left. The negative is placed in A until it is thoroughly bleached. It is washed for at least two minutes and placed in solution B to blacken.

REDUCTION

Reducer, Single Solution (F. M. Steadman).—Red prussiate of potash, size of pea; hyposulphite of soda, six times that volume; water, 6 ounces (for local reduction, 1½ ounces). When reduced wash thoroughly.

Reducer—Ammonium Persulphate.—Ammonium persulphate, 15 grains; water, 1 ounce. The solution should be made just before use. The negative must be perfectly free from hypo, or it will be stained by the persulphate. When the desired reduction has been reached, transfer the negative without washing to a 10 per cent solution of anhydrous sodium sulphite. Wash finally for 15 or 20 minutes.

Reducer—Farmer's.—Dissolve 1 ounce of potassium ferricyanide in 9 ounces of water and make up to 10 ounces, forming a 10 per cent solution. Label this poison. Thoroughly wet the negative to be reduced. Take enough fresh plain hypo, fixing bath for the purpose, and add to it enough of the ferricyanide solution to make it a light straw color. The negative to be reduced is immersed in this solution, when it will be seen to lose density. Rock the tray to insure evenness of action. This reducer can also be used for local treatment.

PRINTING PROCESSES

Blue Prints

Blue Printing Sensitizing Formulæ (Brown).—A. Dissolve 110 grains ferric ammonium citrate (green) in 1 ounce of water. B. Dissolve 40 grains of potassium ferricyanide in 1 ounce of water. These two solutions are made up separately. They are then mixed together and kept in a stoneware bottle, but the single solution should always be filtered before use. The mixture will retain its good qualities for months if kept from the light.

(Millen).—Potassium ferricyanide, 1 ounce; ammonio-citrate of iron 1½ ounces; distilled water, 10 ounces. Mix thoroughly and filter. The solution should have a deep wine color and dry on the paper a lemon-yellow. If the solution is green and has a precipitate, the ammonio-citrate is old and spoiled. The mixture should be kept from the light.

Bromide Paper

Bromide Paper Developers: Hydroquinone-metol. No. 1. Water, 10 ounces; hydroquinone, 52 grains; potassium metabisulphite, 18 grains; sulphite of soda (anhydrous), 5 drams; carbonate of soda (anhydrous), 1¼ ounces. No. 2. Water, 10 ounces; metol, 30 grains; carbonate of soda, drams; sulphite of soda (anhydrous), 5 drams. One or two drops of a potassium bromide 10 per cent solution added to 1 ounce of the mixed developer will increase contrast and keep the whites pure. Equal parts of 1 and 2 give excellent prints from a normal negative; one part of 1 and two of 2 give gray prints with maximum half-tone and gradation; two parts of 1 and one of 2 give vigorous prints from soft delicate negatives.

Amidol for rich blacks (freshly prepared). Distilled (or boiled) water, 4 ounces; sulphite of soda (anhydrous) 45 grains; amidol, 10 to 15 grains. Add a drop of 10 per cent bromide solution to each ounce of developer.

Sepia Tones: Hypo Alum.—Hyposulphite of soda, 5 ounces; ground alum, 1 ounce; boiling water, 70 ounces. Dissolve the hypo in the water and then add the alum slowly. A milk-white solution results which should be decanted when clear. It is not used until cold (about 60 degrees Fahr.).

Sepia Tones: Sulphide of Sodium.—The fixed and washed print is treated with one of the following solutions: (1) Potassium ferricyanide, 10 grains; potassium bromide, 10 grains; water, 1 ounce; or (2) potassium ferricyanide, 20 grains; sodium chloride (common salt), 30 grains; water, 1 ounce. The image will be bleached by either of these solutions in a few minutes, the whitish appearance of the deposit being caused by its change into a salt of silver. After 5 minutes in running water apply the sulphuretting solution: Dissolve 3 ounces of sodium monosulphide in 15 ounces of water; boil the solution for about 10 minutes, filter off the black precipitate formed, and when cooled make up to 25 ounces with water. To tone take of the sulphide solution 1 ounce and add water 12 to 20 ounces.

Red Tones: Copper.—Dissolve 100 grains of ammonium carbonate in 2 ounces of water, and in this solution dissolve 10 grains of sulphate of copper. Then add 20 grains of potassium ferricyanide. A clear, dark green solution results, which gives a red-chalk tone in about 3 minutes. Tone until the deepest shadow is converted, and then wash the print for 10 minutes.

Green Tones: Vanadium.—Bleach print in the following: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce. Wash well and apply: Ferric chloride, 2 grains; vanadium chloride, 2 grains; ammonium chloride, 4 grains; hydrochloric acid, 5 minims; water, 1 ounce.

Blue Tones: Iron—Bleach print in: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce; then tone in ferric chloride, 5 grains; hydrochloric acid, 5 minims; water, 1 ounce.

To prevent blistering on bromide paper (P. L. Anderson).—Immerse after fixing and before washing from 10 to 15 minutes in water, 10 ounces; formaldehyde, 1 ounce. A 10 per cent solution of chrome alum will do equally well.

To make bromide paper translucent (P. L. Anderson).—Lay the paper negative face down on a blotter and paint thinly with the following mixture. Give three coats. Turpentine, 3 ounces; powdered resin, 1 ounce; gum elemi, 1 ounce; paraffine wax, ½ ounce. Heat with stirring until it begins to boil. Allow to cool slightly and add turpentine, 3 ounces.

Carbon Tissue

Carbon Tissue, Sensitizer for (Bennett).—Potassium bichromate, 4 drams; citric acid, 1 dram; strong ammonia water, about 3 drams; water, 25 ounces; dissolve the bichromate and citric acid in hot water, and add sufficient ammonia to change the orange color of the solution to lemon-yellow. Sensitize for 90 seconds; reducing the water softens the gradation in the print; increasing it to 30 ounces gives more vigor.

Carbon Lantern Slides.—Prepare the glass by coating with the following preparation: 180 grains of Nelson's Gelatine No. 1, in 20 ounces water. Add 10 grains bichromate of potash. Dry and allow the plate to be exposed to light for a couple of days to make the coating thoroughly insoluble. Sensitizer for tissue: 1 per cent to 1¼ per cent solution of bichromate of potash. Immerse 2 minutes. Print deeply; expose twice as long as ordinary paper print. Develop in hot water as usual.

Gum Bichromate

Gum Bichromate (Casper Millar). A.—Gum arabic, 1¼ ounces; water, 3½ ounces; salicylic acid, 4 grains.

B.—Chrome alum, 45 grains; water, 3½ ounces. Grind A and B with water and pigment, brush over paper, dry and store.

Suggested formula.—A, 2 ounces; B, 1½ drams; carbon black, 10 grains; sensitize for 2 minutes in 5 per cent bichromate solution.

Kallitype

Kallitype Sensitizer for Black Tones (J. Thomson).—Distilled water, 1 ounce; ferric oxalate (Merck's or Mallinckrodt's), 15 grains; citrate of iron and ammonia (brown scales), 25 grains; chloride of copper, 8 grains; oxalate of potassium, 35 grains; oxalic acid, 15 grains; silver nitrate, 15 grains; gum arabic, 10 grains. For greater contrast add 1 to 10 drops 5 per cent bichromate of potassium solution.

Developer: Stock Solution.—Distilled water, 1 ounce; silver nitrate, 40 grains; citric acid, 10 grains; oxalic acid, 10 grains. Filter. Normal developer 1 dram stock solution and 7 drams of water.

Platinum Papers

Platinum Sensitizer (P. L. Anderson).—Stock solutions: I. Water, hot, distilled, 2 ounces; ferric oxalate, 240 grains; oxalic acid, 16 grains. II. Water, hot, distilled, 2 ounces; ferric oxalate, 240 grains; oxalic acid, 16 grains; potassium chlorate, 4 grains. III. Water, distilled, 19 drams; potassium chloroplatinite, 219 grains (=½ ounce). Keep in amber glass bottles or in the dark. For use take: I, 22 mm.; II, 0 mm.; III, 24 mm. Gives very soft prints. Or I, 12 mm.; II, 10 mm.; III, 24 mm. Results about the same contrast as a P. O. P. print. Or I, 0 mm.; II, 22 mm.; III, 24 mm. Gives extreme contrast.

Above quantities sufficient for a 10 x 12 sheet of ordinary paper. Very smooth requires less and very rough more, up to 25 per cent additional. Apply with a soft fitch or camel-hair brush, allow to surface dry, and make bone-dry over a stove or gas jet. Should dry in not less than five or more than ten minutes.

Platinum: Sensitizing, Gold Bath and Sepia Papers. A.—Chloroplatinite of potassium, 15 grains; distilled water, 90 minims.

B.—Ferric oxalate, 21 grains; oxalic acid, 2 grains; distilled water, 183 minims. For cold bath paper, mix A and B, and add 15 minims of water. For sepia paper mix A and B and add 15 minims of a 5 per cent solution of mercuric chloride. The addition of a few grains of potassium chlorate to any of the above gives increased contrast in the print. From 140 to 170 minims of solution are sufficient to coat a sheet of paper 20 x 26 inches.

Platinum Prints: to Intensify. A.—Sodium formate, 45 grains; water, 1 ounce.

B.—Platinum perchloride, 10 grains; water, 1 ounce.

C.—For use, take 15 minims each of A and B to 2 ounces of water. Immerse prints until sufficiently intensified, then remove and wash.

Platinum Prints to Distinguish from Bromide.—Soak the print in saturated solution of mercuric chloride; a platinum print will not change; a bromide print will bleach.

Salted Papers

Salted Paper Prints: Sensitized with the following: Silver, 480 grains Troy; water, 11 ounces. Dissolve and pour off 2 ounces, and to the 9 ounces left add strong aqua ammonia to form a precipitate and redissolve the precipitate, then add the remaining 2 ounces which will form another precipitate; to this add 9 drops of nitric acid C. P. Apply this to the paper with a tuft of cotton.

Any good toning bath will give good results, such as—Chloride aluminum, 80 grains; bicarbonate soda (anhydrous), 360 grains; water, 48 ounces. When mixed this will form a flaky hydrate which will settle to the bottom. It can be strained through clean washed muslin. To prepare a small bath for toning, take 12 ounces of the stock solution and add sufficient gold to tone in 8 to 10 minutes. The gold solution must be neutralized with bicarbonate soda (anhydrous) before adding to the above bath. When the prints reach the desired tone, throw them into a bath of salt water, made of water, 1 gallon, table salt, 1 ounce.

Printing Out Papers

Gold Toning (B. H. Allbee).—No. 1, 10 per cent solution sulphocyanide of potassium; No. 2, 15 grains chloride of gold in 7½ ounces of water; No. 3, 10 per cent solution phosphate of soda; No. 4, saturated solution borax. Take No. 1, 1 dram; water, 8 drams; No. 2, 4 drams; No. 3, 1 dram; No. 4, 2 drams. In this put print in dry. Toning should be complete in two minutes. Wash as usual.

Gold Toning.—For blue-black tones, for slight strengthening, and for converting rusty black into pure black. Soak prints in warm water, lay on warm glass, brush over glycerine and blot off. Pour on few minims of solution of gold chloride (1 grain per dram), and rapidly brush in all directions. When toned, rinse and sponge back and front with: Metol, 50 grains; sodium sulphite, 1 ounce; potassium carbonate, ½ ounce; water, 20 ounces. Tone in daylight. Do not tone sepias or old prints in this solution.

Gold Toning—To Give Black Tones (A. B. Klugh.)—Solution A. Sodium thiosulphate (hypo), 40 grams; water, 100 cc. Solution B. Lead nitrate, 5 grams; acetic acid, glacial, 5 cc.; water, 50 cc. Add to solution A enough of B to produce a slight milkiness. Filter and add 25 cc. of a 1% solution of gold chloride. Print deeply and tone until a warm black is produced.

Gold Toning Bath. (Alfred J. Jarman).—Filtered water, 30 oz. fluid; acetate of soda, 2 drams; bicarbonate of soda (anhydrous), 20 grains; chloride of gold, 4 grains.

MISCELLANÆ

Adhesive for Labels.—Soak 1 part of the best glue in water until thoroughly swollen, add a little sugar candy, 1 part of gum arabic and 6 parts of water. Boil with constant stirring over a spirit lamp until the whole gets thin. Coat sheets of paper with it; let dry and cut up into convenient sizes.

Blackening Mixture.—Dissolve a 4-ounce stick of licorice in 8 ounces of water with the aid of gentle heat. When dissolved rub into the mixture 1 ounce of burnt sienna in powder, using the back of a spoon for this purpose. When cold, bottle for use.

Bleaching Solution.—(Alfred J. Jarman). Water (ordinary), 20 oz. fluid, bichloride of mercury, 1 oz. fluid, potassium bromide, ¾ oz. fluid. Dissolve and filter the solution.

Cleaning Greasy Bottles.—Wash with benzine, or permanganate of potassium, to which has been added some hydrochloric acid.

Bottles that have contained resinous substances, wash with potash or soda and rinse with alcohol. Bottles that have contained essences, wash with sulphuric acid, then with water.

Clearing Stained Negatives.—Dissolve ⅛ ounce of pulverized alum in 20 ounces of water and add 1 dram of sulphuric acid. Immerse the stained plate in this solution for a few minutes; remove plate wash and then set in the rack to dry.

Film: to Remove from Glass: Make two solutions. A.—Sodium flouride, 6 grains; water, 4 ounces.

B.—Sulphuric acid, 6 drops; water, 1 ounce. Place the negative in solution A for 2 minutes and then place directly in solution B. After another 2 minutes lift the film with the finger from one corner of the plate. It will soon leave the glass.

Firelight Effects on Developing Paper (H. S. Hood). No. 1.—Water, 5 drams; copper sulphate, 10 per cent solution, 15 minims; ammonium carbonate, 10 per cent solution. Add till precipitate first formed is redissolved.

No. 2—Water, 4½ ounces; potassium ferricyanide, 6/10 drams. Mix separately and add No. 2 to No. 1. The print will turn bright red. Wash well.

Ground Glass: Substitutes for. 1.—Paraffine wax makes an excellent substitute for ground glass if the latter should get broken. Iron the paper onto a sheet of plain glass. It is more transparent than the focusing screen, and the image will appear clearer; hence, in exposing allowance must be made for the difference in illumination.

2.—Resin dissolved in wood alcohol and blown over the glass; this must not be scratched; it gives a very fine-grained ground glass effect.

3.—White wax, 120 grains; ether, 1 ounce.

Ground Glass Varnish: Sandarac, 90 grains; mastic, 20 grains; ether, 2 ounces. Dissolve the resins in the ether and add benzole ½ to 1½ ounces.

Lens: to Clean.—The lens should always be kept free from dust or other impurities. To clean it, spread upon a table a clean sheet of paper; take the lens apart, and with a camel-hair brush dust each of the combinations on both sides. If the surfaces of the lenses are very dirty and have lost their polish, make up the following: Nitric acid, 3 drops; alcohol, 1 ounce; distilled water, 2 ounces. Dip a tuft of filtering cotton in this solution, rub each side of the lens, then polish with an absolutely clean chamois. Clean the lens tube before replacing the lenses, each of which should be finally dusted with a camel-hair brush.

Mounting Without Cockling (W. S. Davis).—Coat back of dry print with as strong a solution of warm gelatine (pure table gelatine will do) as can be spread easily. Allow to dry, then attach to mount by dampening the mount with water, then lay print in desired position; cover with a sheet of bond or smooth paper, and apply a warm flat iron until the gelatine melts. Very effective for thin mounting material, as there is no cockling if the mount contains just the right amount of water.

Paste, Starch (A. Lomax).—Powdered starch, 1 ounce; cold water, 12 ounces. Mix smooth with a glass rod, heat to boiling point. Boil half a minute stirring all the time. Use cold.

Poisons and Antidotes.—Administer the antidote as soon as possible. If a strong acid or alkali, or cyanide of potassium, has been swallowed, lukewarm water in large quantities should be swallowed at once. Where strong acids or alkalies have not been swallowed, rid the stomach of the poison by vomiting; for this purpose take 25 grains of zinc sulphate in warm water.

Polished surfaces: to Photograph.—Smear the surface with soft putty so as to deaden the reflections. Photograph the article against a black background and stop off all reflections, allowing the light to come from one direction only. To photograph hollow cut glassware, fill with ink or aniline black water dye. Before photographing machinery deaden the bright parts with putty.

Stains: to Remove from the Hands.—Developer stains: solution of citric or oxalic acid. Silver nitrate stains: Water, 4 ounces; chloride of lime, 350 grains; sulphate of soda, 1 ounce. Apply with a brush.

Test for Hypo: Potassium permanganate, 2 grains; potassium carbonate, 20 grains; distilled water, 40 ounces. Soak the plate or print to be treated in water for one hour, then remove and add to the water a few drops of the above solution, which will turn a greenish yellow or brown if the water is not free from hypo.

COMPARISON OF VALUES
COMPILED BY CHAS. LE B. GOELLER

Taking for a standard f.8 as a unit of measurement.

Speed increased.	Opening twice as fast.					
f:8 = 1	Twice as fast	as	f:11.3	exposure	1	sec.
7.5 = 1⅛	“	as	10.6	“	0.88	“
6.8 = 1⅜	“	as	9.6	“	0.725	“
6.3 = 1 3–5	“	as	8.8	“	0.625	“
6. = 1 7–9	“	as	8.5	“	0.5625	“
5.6 = 2	“	as	8	“	0.5	“
4.5 = 3 1–6	“	as	6.3	“	0.3125	“

UNITED STATES WEIGHTS AND MEASURES

According to Existing Standards

LINEAR

	Inches	Feet	Yards	Rods	Fur's	Mi.
12 inches = 1 foot.	12	1				
3 feet = 1 yard.	36	3	1			
5.5 yards = 1 rod.	198	16.5	5.5	1		
40 rods = 1 furlong.	7,920	660	220	40	1	
8 furlongs = 1 mile.	63,360	5,280	1,760	320	8	1

SURFACE—LAND

	Feet	Yards	Rods	Roods	Acres
144 sq. ins. = 1 sq. ft.					
9 sq. ft. = 1 sq. yd.	9	1			
30.25 sq. yds. = 1 sq. rod.	272.25	30.25	1		
40 sq. rods = 1 sq. rood.	10,890	1,210	40	1	
4 sq. roods = 1 acre.	43,560	4,840	160	4	1
640 acres = 1 sq. mile.	27,878,400	3,097,600	102,400	2,560	640

VOLUME—LIQUID

4 gills = 1 pint.
2 pints = 1 quart.
4 quarts = 1 gallon.

Gills	Pints	Gallon	Cub. In.
32	8	1	231

FLUID

Gallon	Pints	Ounces	Drachms	Minims	Cubic Centimetres
1	8	128	1,024	61,440	3,785,435
	1	16	128	7,680	473,179
		1	8	480	29,574
			1	60	3,697

16 ounces, or a pint, is sometimes called a fluid pound.

TROY WEIGHT

Pound	Ounces	Pennyweights	Grains	Grams
1	12	240	5,760	373.24
	1	20	480	31.10
		1	24	1.56

APOTHECARIES' WEIGHT

lb. Pound	℥ Ounces	ʒ Drachms	℈ Scruples	gr. Grains	Grams
1	12	96	288	5,760	373.24
	1	8	24	480	31.10
		1	3	60	3.89
			1	20	1.30
				1	.06

The pound, ounce, and grain are the same as in Troy weight.

AVOIRDUPOIS WEIGHT

Pound	Ounces	Drachms	Grains (Troy)	Grams
1	16	256	7,000	453.60
	1	16	437.5	28.35
		1	27.34	1.77

ENGLISH WEIGHTS AND MEASURES

APOTHECARIES' WEIGHT

20 Grains = 1 Scruple = 20 Grains.
3 Scruples = 1 Drachm = 60 Grains.
8 Drachms = 1 Ounce = 480 Grains.
12 Ounces = 1 Pound = 5,760 Grains.

FLUID MEASURE

60 Minims = 1 Fluid Drachm
8 Drachms = 1 Fluid Ounce
20 Ounces = 1 Pint
8 Pints = 1 Gallon

The above weights are usually adopted in formulas.

All Chemicals are usually sold by

AVOIRDUPOIS WEIGHT

$27\frac{11}{32}$ Grains = 1 Drachm = $27\frac{11}{32}$ Grains
16 Drachms = 1 Ounce = $437\frac{1}{2}$ Grains
16 Ounces = 1 Pound = 7,000 Grains

Precious Metals are usually sold by

TROY WEIGHT

24 Grains = 1 Pennyweight = 24 Grains
20 Pennyweights = 1 Ounce = 480 Grains
12 Ounces = 1 Pound = 5,760 Grains

NOTE.—An ounce of metallic silver contains 480 grains, but an ounce of nitrate of silver contains only $437\frac{1}{2}$ grains.

UNITED STATES FLUID MEASURE

Gal.	Pints.	Ounces.	Drachms.	Mins.	Cub. In.	Grains.	Cub. C.M.
1	= 8	= 128	= 1,024	= 61,440	= 231.	= 58,328.886	= 3,785.44
	1	= 16	= 128	= 7,680	= 28.875	= 7,291.1107	= 473.18
		1	= 8	= 480	= 1.8047	= 455.6944	= 29.57
			1	= 60	= 0.2256	= 56.9618	= 3.70

IMPERIAL BRITISH FLUID MEASURE

Gal.	Pints.	Ounces.	Drachms.	Mins.	Cub. In.	Grains.	Cub. C.M
1	= 8	= 160	= 1,280	= 76,800	= 277.27384	= 70,000	= 4,543.732
	1	= 20	= 160	= 9,600	= 34.65923	= 8,750	= 567.966
		1	= 8	= 480	= 1.73296	= 437.5	= 28.398
			1	= 60	= 0.21662	= 54.69	= 3.550

METRIC SYSTEM OF WEIGHTS AND MEASURES

MEASURES OF LENGTH

Denominations and Values		Equivalents in Use	
Myriameter	10,000 meters.	6.2137	miles.
Kilometer	1,000 meters.	.62137	mile, or 3,280 ft. 10 ins.
Hectometer	100 meters.	328.	feet and 1 inch.
Dekameter	10 meters.	393.7	inches.
Meter	1 meter.	39.37	inches.
Decimeter	1-10th of a meter.	3.937	inches.
Centimeter	1-100th of a meter.	.3937	inch.
Millimeter	1-1000th of a meter.	.0394	inch.

MEASURES OF SURFACE

Denominations and Values		Equivalents in Use	
Hectare	10,000 square meters.	2.471	acres.
Are	100 square meters.	119.6	square yards.
Centare	1 square meter.	1,550.	square inches

MEASURES OF VOLUME

Denominations and Values			Equivalents in Use			
Names	No. of Liters	Cubic Measures	Dry Measure		Wine Measure	
Kiloliter or stere	1,000	1 cubic meter.	1.308	cubic yards.	264.17	gallons.
Hectoliter	100	1-10th cubic meter.	2	bu. and 3.35 pecks.	26.417	gallons.
Dekaliter	10	10 cubic decimeters.	9.08	quarts.	2.6417	gallons.
Liter	1	1 cubic decimeter.	.908	quart.	1.0567	quarts.
Deciliter	1–10	1-10th cubic decimeter.	6.1023	cubic inches.	.845	gill.
Centiliter	1–100	10 cubic centimeters	.6102	cubic inch.	.338	fluid oz.
Milliliter	1–1000	1 cubic centimeter.	.061	cubic inch.	.27	fl. drm.

WEIGHTS

Denominations and Values			Equivalents in Use	
Names	Number of Grams	Weight of Volume of Water at its Maximum Density	Avoirdupois Weight	
Millier or Tonneau	1,000,000	1 cubic meter.	2204.6	pounds.
Quintal	100,000	1 hectoliter.	220.46	pounds.
Myriagram	10,000	10 liters.	22.046	pounds.
Kilogram or Kilo	1,000	1 liter.	2.2046	pounds.
Hectogram	100	1 deciliter.	3.5274	ounces.
Dekagram	10	10 cubic centimeters.	.3527	ounce.
Gram	1	1 cubic centimeter.	15.432	grains.
Decigram	1–10	1-10th of a cubic centimeter.	1.5432	grain.
Centigram	1–100	10 cubic millimeters.	.1543	grain.
Milligram	1–1000	1 cubic millimeter.	.0154	grain.

For measuring surfaces, the square dekameter is used under the term of ARE; the hectare, or 100 ares, is equal to about 2½ acres. *The unit of capacity* is the cubic decimeter or LITER, and the series of measures is formed in the same way as in the case of the table of lengths. The cubic meter is the unit of measure for solid bodies, and is termed STERE. *The unit of weight* is the GRAM, which is the weight of one cubic centimeter of pure water weighed in a vacuum at the temperature of 4 deg. Cent. or 39.2 deg. Fahr., which is about its temperature of maximum density. In practice, the term cubic centimeter, abbreviated c.c., is generally used instead of milliliter and cubic meter instead of kiloliter

CONVERSION OF METRIC INTO ENGLISH MEASURE

1	cubic centimeter	= 17	minims						
2	cubic centimeters	= 34	"						
3	"	= 51	"						
4	"	= 68	"	or	1 dram	8	minims		
5	"	= 85	"	"	1 "	25	"		
6	"	= 101	"	"	1 "	41	"		
7	"	= 118	"	"	1 "	58	"		
8	"	= 135	"	"	2 drams	15	"		
9	"	= 152	"	"	2 "	32	"		
10	"	= 169	"	"	2 "	49	"		
20	"	= 338	"	"	5 "	38	"		
30	"	= 507	"	"	1 ounce	0	dram	27	minims
40	"	= 676	"	"	1 "	3	drams	16	"
50	"	= 845	"	"	1 "	6	"	5	"
60	"	= 1014	"	"	2 ounces	0	"	54	"
70	"	= 1183	"	"	2 "	3	"	43	"
80	"	= 1352	"	"	2 "	6	"	32	"
90	"	= 1521	"	"	3 "	1	"	21	"
100	"	= 1690	"	"	3 "	4	"	10	"
1000	"	= 1 liter =			35 "	1	"	40	"

CONVERSION OF METRIC INTO ENGLISH WEIGHT

The following table, which contains no error greater than one-tenth of a grain, will suffice for most practical purposes.

1 gram	= 15⅖	grains.				
2 grams	= 30⅘	"				
3 "	= 46⅕	"				
4 "	= 61⅘	"	....................or	1 dram	1⅘	grain
5 "	= 77⅕	"	....................."	1 "	17⅕	grains
6 "	= 92⅗	"	....................."	1 "	32⅗	"
7 "	= 108	"	....................."	1 "	48	"
8 "	= 123⅖	"	....................."	2 drams	3⅖	"
9 "	= 138⅘	"	....................."	2 "	18⅘	"
10 "	= 154⅖	"	....................."	2 "	34⅖	"
11 "	= 169⅘	"	....................."	2 "	49⅘	"
12 "	= 185⅕	"	....................."	3 "	5⅕	"
13 "	= 200⅗	"	....................."	3 "	20⅗	"
14 "	= 216	"	....................."	3 "	36	"
15 "	= 231⅖	"	....................."	3 "	51⅖	"
16 "	= 247	"	....................."	4 "	7	"
17 "	= 262⅖	"	....................."	4 "	22⅖	"
18 "	= 277⅘	"	....................."	4 "	37⅘	"
19 "	= 293⅕	"	....................."	4 "	53⅕	"
20 "	= 308⅗	"	....................."	5 "	8⅗	"
30 "	= 463	"	....................."	7 "	43	"
40 "	= 617⅕	"	....................."	10 "	17⅕	"
50 "	= 771⅗	"	....................."	12 "	51⅗	"
60 "	= 926	"	....................."	15 "	26	"
70 "	= 1080⅕	"	....................."	18 "	0⅕	"
80 "	= 1234⅗	"	....................."	20 "	34⅗	"
90 "	= 1389	"	....................."	23 "	9	"
100 "	= 1543⅕	"	....................."	25 "	43⅕	"
1000 "	= 1 kilogram = 32 oz., 1 dr., 12⅖ gr.					

CONVERSION OF ENGLISH INTO METRIC MEASURE

BY C. LE BARON GOELLER

An easy way to convert English measure formulae into Metric is as follows: Have all dry measures in grains. Then multiply the number of ounces of water in the English measure formulae by 16 and read the grains as grams.. The multiplier should be 15.43, but 16 is near enough for all practical purposes.

THERMO DEVELOPMENT

Reprinted by permission from Thermo Development Chart, published by the American Photographic Publishing Company, Boston 17, Mass.

TABLE OF TEMPERATURES

Degrees Fahrt.	Min. Tray	Min. Tank	Min. Tray	Min. Tank
	T.C.1.9.		T.C.2.6	
80	3¼	12	1¾	7¾
78	3½	13	2	8½
76	3¾	14	2¼	9½
74	4	15	2½	10¾
72	4¼	16	2¾	11¾
70	4½	17	3	13
68	5	18¼	3¼	14½
66	5¼	19½	3¾	16
64	5¾	21	4	18
62	6¼	22½	4½	20
60	6½	24	5	22
58	7	26	5½	24½
56	7½	28	6	27
54	8	30	6½	30
52	8½	32	7½	33
50	9¼	34	8½	37
48	10	37	9½	41½
46	10¾	40	10½	46
44	11½	43	11½	51½
42	12¼	46	12¾	57
40	13¼	49	14½	63

TABLE OF DEVELOPMENT SPEEDS

ANSCO FILM, MS. BARNET—Super-speed Ortho, M; Extra Rapid Ortho, MS. Red Seal, M; Red Diamond, MS; Self-screen Ortho, MS; CENTRAL—Special XX., S; Special, M; Comet, M; Colornon, MQ; Panortho, MQ; CRAMER—Crown S; Anchor, MQ; Banner X, S; Inst. Iso., MQ; Med. Iso. MQ; Commercial Isonon, MQ; Portrait Isonon, M; Trichromatic, MQ; Spectrum, MQ; Slow Iso, MQ; Contrast, VVQ. ENSIGN FILM, MS. HAMMER—Special Extra Fast, MS; Extra Fast, M; Aurora Extra Fast, MS; Ortho Extra Fast, M; Ortho Nonhal., M; Fast, MQ; Slow, VQ. Ortho Slow, VQ. ILFORD—Monarch, VS; Zenith, VS; Special Rapid, VS; Rapid Chromatic, M; Ordinary, Q. IMPERIAL—Flash Light, M; Special Sensitive, MQ; Orthochrome S.S., MQ; Special Rapid, S; Orthochrome S.R., MS; Non-filter, MQ. KODAK—Speed Film, S; N.C. Film, S; Portrait Film, S. MARION—Record, S; P.S.; MS. PAGET—XXX M; XXXXX, MS; Swift., S; Ex. Spec. Rap., S; Ortho. Ex. Spec. Rap., MQ; Panchro Ord, Q; Panchro. Color, VQ; Spec. Rap., S; Hydra Panchro., MQ; Hydra Rapid, MQ. PREMO FILM PACK—S. SEED—Graflex, S; 30 Gilt Edge, MS; 26 X, MS; 23, MQ; L Ortho, MQ; Non-halation, MQ; Panchromatic, VQ. STANDARD—Extra, Orthonon, MQ; Polychrome, MQ. STANLEY—50, M; Commercial, MQ. WELLINGTON—Extreme, S; 'Xtra Speedy, MS; Film, MS; Iso Speedy, M; Portrait Speedy, M; Anti-Screen, M; Speedy Spec. Rap., M; Ortho Process, M; Wratten—Panchro, MQ; Process Panchro, Q.

WATKINS THERMO PYRO-SODA T. C. 1.9

a.	Potassium metabisulphite	80 gr.
	Pyro	160 gr.
	Sodium sulphite, dry	1 oz.
	Water to make	10 oz.
b.	Sodium carbonate, dry	2 oz.
	Potassium bromide	40 gr.
	Water to make	10 oz.

MODIFIED THERMO M. Q. T. C. 1.9

a.	Potassium metabisulphite	60 gr.
	Metol	30 gr.
	Hydrochinon	90 gr.
	Water to make	20 oz.
b.	Sodium sulphite, dry	1 oz.
	Sodium carbonate, dry	1½ oz.
	Water to make	20 oz.

MODIFIED THERMO D. Q. T. C. 2.6

a.	Potassium metabisulphite	60 gr
	Duratol	30 gr.
	Hydrochinon	90 gr.
	Water to make	20 oz.
b.	Sodium sulphite, dry	1½ oz.
	Sodium carbonate, dry	2 oz.
	Water to make	20 oz.

INSTRUCTIONS.—Look up the Development Speed of the plate or film and mix the developer as directed for that class, USING WATER WHICH HAS STOOD IN THE ROOM LONG ENOUGH TO ATTAIN ROOM TEMPERATURE. In safe ruby light (or total darkness) place the plate in the tray, flow it with developer, cover the tray light-tight, and note the time. We recommend handling plates in total darkness and using white light while they are covered. Now observe the temperature of the room and consult the Table of Temperatures, where the correct time for development will be found opposite the degree and under the Temperature-Coefficient of the developer in use. The tray may be rocked now and then during development, but the plate should not be removed from the solution until the time is up. Then turn out the white light and rinse and fix the plate by safe light or in a covered tank.

If the first trial does not give the right printing quality to suit your requirements, classify the plate one class nearer VS for more or one class farther from VS for less contrast.

DILUTION OF DEVELOPER.—	VVQ	VQ	Q	MQ	M	MS	S	VS
Watkins Thermo Pyro-Soda....	1	1⅓	1¾	2¼	3	4	5	6¾
Modified Thermo M.-Q....... Modified Thermo Duratol.....	1½	2	2⅔	3½	4½	6	8	10

drams of each stock to be diluted to make total volume 3 ounces for tray or 10 ounces for tank development.

Rodinal (Citol, Azol, Certinal)..	20	26	35	45	60	80	105	135

minims solution to be made up to 3 ounces for tray or 9 ounces for tank. T. C. 1.9.

Dilution of Dev.	V VQ	V Q	Q	M Q	M	M S	S	V S
Metabisulphite grs. Potass......	1.68	* 2¼	3.	4.	5.	6.8	9.	12.
Metol........	.84 } or 1.68	1⅛ } or 2¼	1½ } or 3	2. } or 4	2½ } or 5	3.4 } 6.8	4½ } or 9	6 } 12
Hydrochinon..	2.52 } 1.68	3⅜ } 2¼	4½ } 3	6. } 4	7½ } 5	10.2 } 6.8	13½ } 9	18 } 12
Sod.Sulphite..	12.5	16½	22.	28.	37.	50.	66.	82.
Sod.Carbonate	18.75	24¾	33.	42.	55.	70.	99.	123.
Water........	30 ʒ	30 ʒ	30 ʒ	30 ʒ	30 ʒ	30 ʒ	30 ʒ	30 ʒ

*For flashlight pictures equal parts of Hydrochinon and Eikonogen give softer effects.

N.B.—A single portion of developer should be used for only one plate, but the used developer (except pyro) should be saved for paper. If fog occurs, add to each ounce of water used for diluting, 7½ to 10 grs. dry sulphite.

Thermo Hydro-Metol Developer

Metric-Grams (for 32 oz. Water-Tank)

Compiled by C. LeBaron Goeller

Dilution	VVQ	VQ	Q	MQ	M	MS	S	VS
Pot. Metabis	.112	.150	.2	.27	.33	.45	.6	.8
Metol	.056	.075	.1	.135	.17	.225	.3	.4
Hydrochin	.168	.225	.3	.4	.5	.675	.9	1.2
Sod. Sulph	.822	1.100	1.5	1.8	2.5	3.33	4.5	6.
Sod. Carb	1.232	1.650	2.2	2.7	3.75	5.	6.6	8.8
Water	32 oz.	32 oz.	32 oz.	32 oz.	32 oz.	32 oz.	32 oz.	32 oz.

For softer results reverse the Metol and Hydrochinone content.

Thermo-Pyro { 30 oz. Tank / 9 oz. Tray

Figures = grains of substance

	VVQ	VQ	Q	MQ	M	MS	S	VS
Potass. Metabis	3	4	4¾	6¾	9	12	14½	20
Pyro	6	8	9½	13½	18	24	29	40
Sod. Carb. (anhyd.)	17	22	29	37	50	66	80	112
Sod. Sulph. (anhyd.)	34	44	58	74	100	132	160	224
Pot. Brom	1½	2	2½	3½	4½	6	7¼	10

Thermo-PYRO

Metric System.—Grams. { 900 cc. Water for Tank. / 270 cc. Water for Tray.

Nearest Old Nomenclature	VVQ	VQ	Q	⅓S	½MS	MQ	½S	2Q	⅔S	MS	2MQ	S	VS
New Name	A	B	C	D	E	F	G	H	I	J	K	L	M
Potass. Meta Bis	.200	.250	.300	.350	.400	.450	.500	.600	.700	.800	.900	1.000	1.300
Pyro (or Eikonogen or Metol ¼ and Pyro ¾)	.400	.500	.600	.700	.800	.900	1.000	1.200	1.400	1.600	1.800	2.000	2.600
Sod. Sulphite (Anh)	1.100	1.375	1.650	1.925	2.200	2.475	2.750	3.300	3.850	4.400	4.950	5.500	7.150
Sod. Carb. (Anh)	2.200	2.750	3.300	3.850	4.400	4.950	5.500	6.600	7.700	8.800	9.900	11.000	14.300
Pot. Brom	.100	.125	.150	.175	.200	.225	.250	.300	.350	.400	.450	.500	.650

Table for Making Standard Per Cent Solutions. (From Fitch's Medical Formulary)

1 grain to 1 ounce makes ¼ of 1 per cent solution
2 grains to 1 ounce make ½ of 1 per cent solution
4 grains to 1 ounce make 1 per cent solution
8 grains to 1 ounce make 2 per cent solution

16 grains to 1 ounce make 4 per cent solution
20 grains to 1 ounce make 5 per cent solution
24 grains to 1 ounce make 6 per cent solution
32 grains to 1 ounce make 8 per cent solution

40 grains to 1 ounce make 10 per cent solution
60 grains to 1 ounce make 15 per cent solution
80 grains to 1 ounce make 20 per cent solution

THE ELEMENTS:

THEIR NAMES, SYMBOLS, AND ATOMIC WEIGHTS OXYGEN STANDARD.

Compiled by HENRY F. RAESS.

1915

Aluminum	Al	27.10
Antimony	Sb	120.20
Argon	A	39.88
Arsenic	As	74.96
Barium	Ba	137.37
Bismuth	Bi	208.00
Boron	B	11.00
Bromine	Br	79.92
Cadmium	Cd	112.40
Caesium	Cs	132.81
Calcium	Ca	40.07
Carbon	C	12.00
Cerium	Ce	140.25
Chlorine	Cl	35.46
Chromium	Cr	52.00
Cobalt	Co	58.97
Columbium	Cb	93.50
Copper	Cu	63.57
Dysprosium	Dy	162.50
Erbium	Er	167.70
Europium	Eu	152.00
Fluorine	F	19.00
Gadolinium	Gd	157.30
Gallium	Ga	69.90
Germanium	Ge	72.50
Glucinum	Gl	9.10
Gold	Au	197.20
Helium	He	3.96
Holmium	Ho	163.50
Hydrogen	H	1.008
Indium	In	114.80
Iodine	I	126.92
Iridium	Ir	193.10
Iron	Fe	55.84
Krypton	Kr	82.92
Lanthanum	La	139.00
Lead	Pb	207.10
Lithium	Li	6.94
Lutecium	Lu	174.00
Magnesium	Mg	24.32
Manganese	Mn	54.93
Mercury	Hg	200.60
Molybdenum	Mo	96.00
Neodymium	Nd	144.30
Neon	Ne	20.20
Nickel	Ni	58.68
Niton	Nt	222.40
Nitrogen	N	14.01
Osmium	Os	190.90
Oxygen	O	16.00
Palladium	Pd	106.70
Phosphorus	P	31.04
Platinum	Pt	195.20
Potassium	K	39.10
Praseodymium	Pr	140.60
Radium	Ra	226.40
Rhodium	Rh	102.90
Rubidium	Rb	85.45
Ruthenium	Ru	101.70
Samarium	Sa	150.40
Scandium	Sc	44.10
Selenium	Se	79.20
Silicon	Si	28.30
Silver	Ag	107.88
Sodium	Na	23.00
Strontium	Sr	87.63
Sulphur	S	32.07
Tantalum	Ta	181.50
Tellurium	Te	127.50
Terbium	Tb	159.20
Thallium	Tl	204.00
Thorium	Th	232.40
Thulium	Tm	168.50
Tin	Sn	119.00
Titanium	Ti	48.10
Tungsten	W	184.00
Uranium	U	238.50
Vanadium	V	51.00
Xenon	Xe	130.20
Ytterbium	Yb	173.50
Yttrium	Yt	89.00
Zinc	Zn	65.37
Zirconium	Zr	90.60

TABLE OF COMPARATIVE PLATE SPEED NUMBERS

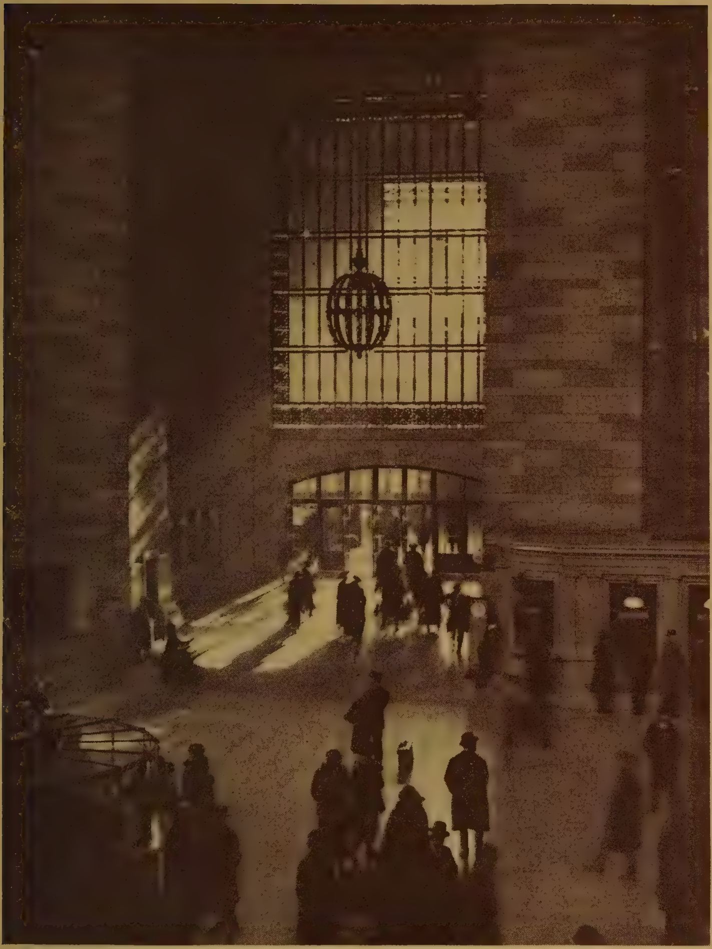
H & D	Watkins P No.	Wynne F No.	H & D	Watkins P No.	Wynne F No.
10	15	24	220	323	114
20	30	35	240	352	120
40	60	49	260	382	124
80	120	69	280	412	129
100	147	77	300	441	134
120	176	84	320	470	138
140	206	91	340	500	142
160	235	98	380	558	150
200	294	109	400	588	154

The above Watkins and Wynne numbers are equivalent to the H and D, only when the latter is determined in accordance with the directions of Hurter and Driffield, that is with pyro-soda developer and using the straight portion only of the density curve.

To convert H and D into Watkins: Multiply H and D by 50 and divide by 34. For all practical purposes the Watkins P number is 1½ times H and D.

To convert Watkins into Wynne F Nos.: Extract the square root and multiply by 6.4.

The above methods have been approved by the Watkins Meter Company and the Infallible Exposure Meter Company.



SHADOWS IN GRAND CENTRAL STATION, NEW YORK.
Robert A. Knudtsen.

TABLE FOR CALCULATING DISTANCES IN ENLARGING OR REDUCING

From The British Journal Photographic Almanac

Focus of Lens	Times of Enlargement and Reduction							
Inches	1 Inch	2 Inches	3 Inches	4 Inches	5 Inches	6 Inches	7 Inches	8 Inches
2..........	4 4	6 3	8 2⅔	10 2½	12 2⅖	14 2⅓	16 2²⁄₇	18 2¼
2½........	5 5	7½ 3¾	10 3⅓	12½ 3⅛	15 3	17½ 2⁹⁄₁₀	20 2⁶⁄₇	22½ 2³⁄₁₆
3..........	6 6	9 4½	12 4	15 3¾	18 3⅗	21 3½	24 3³⁄₇	27 3⅜
3½........	7 7	10½ 5¼	14 4⅔	17½ 4¾	21 4⅕	24½ 4¹⁄₁₂	28 4	31½ 3⁹⁄₁₀
4..........	8 8	12 6	16 5⅓	20 5	24 4⅘	28 4⅔	32 4⁴⁄₇	36 4½
4½........	9 9	13½ 6¾	18 6	22½ 5⅗	27 5⅖	31½ 5¼	36 5⅐	40½ 5¹⁄₁₆
5..........	10 10	15 7½	20 6⅔	25 6¼	30 6	35 5⅚	40 5⁵⁄₇	45 5⅝
5½........	11 11	16½ 8¼	22 7⅓	27½ 6⅘	33 6½	38½ 6⁵⁄₁₂	44 6²⁄₇	49½ 6³⁄₁₆
6..........	12 12	18 9	24 8	30 7½	36 7⅕	42 7	48 6⁶⁄₇	54 6¾
7..........	14 14	21 10½	28 9⅓	35 8¾	42 8⅖	49 8⅙	56 8	63 7⅞
8..........	16 16	24 12	32 10⅔	40 10	48 9⅗	56 9⅓	64 9⅐	72 9
9..........	18 18	27 13½	36 12	45 11¼	54 10⅘	63 10½	72 10²⁄₇	81 10⅛

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical center. The use of the table will be seen from the following illustration: A photographer has a *carte* to enlarge to four times its size, and the lens he intends employing is one of 6 inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 on the first vertical column and carry his eye to where these two join, which will be 30-7½. The greater of these is the distance the sensitive plate must be from the center of the lens; and the lesser, the distance of the picture to be copied. To *reduce* a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be 12 inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

TABLES OF DISTANCES AT AND BEYOND WHICH ALL OBJECTS ARE IN FOCUS WHEN SHARP FOCUS IS SECURED ON INFINITY

(Figured for a circle of confusion of 1/100 inch)

Focal Length of Lens in Inches	Ratio marked on Stops													
	f/4	*f*/5.6	*f*/6	*f*/7	*f*/8	*f*/10	*f*/11	*f*/15	*f*/16	*f*/20	*f*/22	*f*/32	*f*/44	*f*/64
	Number of feet after which all is in focus													
4	33	24	22	19	17	13	12	9	8	7	6	4	3	2
4¼	38	27	25	21	19	15	14	10	10	7	7	5	3½	2½
4½	42	30	28	24	21	17	15	11	11	8½	7½	5½	4	3
4¾	47	34	31	27	24	19	17	12	12	9½	8½	6	5	3
5	52	36	35	30	26	21	19	14	13	10½	9½	6½	5½	3½
5¼	57	40	38	33	28	23	21	15	14	11½	10½	7	5½	3½
5½	63	45	43	36	31	25	23	17	15	12½	11½	7½	6	4
5¾	68	50	46	38	34	27	25	18	17	13½	13	8½	6½	4
6	75	54	50	42	38	30	28	20	19	15	14	9	7	4½
6¼	81	58	54	46	40	32	29	22	20	16	15	10	7½	5
6½	87	62	58	50	44	35	32	23	22	17½	16	11	8	5½
6¾	94	67	63	54	47	38	34	25	24	19	17	12	8½	6
7	101	72	68	58	51	40	37	27	25	20	18	12½	9	6
7¼	109	78	73	62	54	44	39	29	27	22	20	13½	10	6½
7½	117	83	78	64	58	47	42	31	29	24	21	14½	10½	7
7¾	124	90	83	71	62	50	45	33	31	25	22	15½	11	7½
8	132	96	88	76	68	52	48	36	32	28	24	16	12	8
8¼	141	100	94	80	71	56	51	37	35	29	25	17½	12½	8½
8½	150	104	100	84	76	60	56	40	38	30	27	19	13½	9
8¾	156	111	104	89	78	63	57	42	39	32	29	20	14	10
9	168	120	112	96	84	67	61	45	42	34	31	21	15	10½
9¼	180	127	116	101	90	71	65	47	45	35	32	22	16	11
9½	190	133	125	107	95	75	68	50	47	37	34	24	17	12
9¾	197	141	131	113	99	79	72	52	50	39	36	25	18	12½
10	208	148	140	120	104	83	75	55	52	42	38	26	19	13

If sharp focus is secured on any of the distances shown, then with the stop indicated all objects are in focus from half the distance focused on up to infinity.

LENGTH OF STUDIO

REQUIRED FOR LENSES OF DIFFERENT FOCAL LENGTHS FROM 6 TO 8 FEET IS ALLOWED FOR THE CAMERA AND OPERATOR

From "Photographic Lenses" by BECK and ANDREWS

Focus of Lens	Size	Kind of Portrait	Length of Studio	Dist. of Lens from Object
Inches			In Feet	In Feet
6	Carte de Visite 3¼x4¼..........	Full Length	18 to 20	11 to 12
7½	Carte de Visite................	Full Length	22 to 25	14 to 15
8½	Carte de Visite................	Full Length Bust	24 to 28 10 to 15	17 to 19 5
9½	Cabinet and smaller groups.......	Full Length Bust	20 to 23 12 to 17	12 to 13 7
11	Cabinet and 5x7 groups..........	Full Length Bust	25 to 30 13 to 20	17 to 18 8
14½	Cabinets, panels and 6½x8½ groups......................	Full Length Bust	32 to 40 14 to 20	23 to 24 7
19	10x12 portraits or groups.........	Full Length Bust	20 to 25 14 to 20	13 7
24	16x20 portraits or groups.........	Full Length Bust	25 to 30 14 to 20	14 8

"UNIFORM SYSTEM" NUMBERS FOR STOPS FROM

$\frac{f}{1}$ TO $\frac{f}{100}$

In the following table Mr. S. A. Warburton calculated the exposure necessary with every stop from $\frac{f}{1}$ to $\frac{f}{100}$ compared with the unit stop of the "uniform system" of the Photographic Society of Great Britain. The figures which are underlined show in the first column what $\frac{f}{a}$ must be in order to increase the exposure in geometrical ratio from $\frac{f}{4}$, the intermediate numbers showing the uniform system number for any other aperture.

f	U. S. No.	f	U. S. No.	f	U. S. No.
1	1⁄16	15	14.06	58	210.25
1¼	.097	16	16	59	217.56
1.414	⅛	17	18.06	60	225.00
1½	.140	18	20.25	61	232.56
1¾	.191	19	22.56	62	240.25
2	¼	20	25.00	63	248.06
2¼	.316	21	27.56	64	256
2½	.390	22	30.25	65	264.06
2.828	½	22.62	32	66	272.25
2¾	.472	23	33.06	67	280.56
3	.562	24	36.00	68	289.00
3¼	.660	25	39.06	69	297.56
3½	.765	26	42.25	70	306.25
3¾	.878	27	45.56	71	315.06
4	1	28	49.00	72	324.00
4¼	1.12	29	52.56	73	333.06
4½	1.26	30	56.25	74	342.25
4¾	1.41	31	60.06	75	351.56
5	1.56	32	64	76	361.00
5¼	1.72	33	68.06	77	370.56
5½	1.89	34	72.25	78	380.25
5.656	2	35	76.56	79	390.06
5¾	2.06	36	81.00	80	400.00
6	2.25	37	85.56	81	410.06
6¼	2.44	38	90.25	82	420.25
6½	2.64	39	95.06	83	430.56
6¾	2.84	40	100.00	84	440.00
7	3.06	41	105.06	85	451.56
7¼	3.28	42	110.25	86	462.25
7½	3.51	43	115.56	87	473.06
7¾	3.75	44	121.00	88	484.00
8	4	45	126.56	89	495.06
8¼	4.25	45.25	128	90	506.25
8½	4.51	46	132.25	90.50	512
8¾	4.78	47	138.06	91	517.56
9	5.06	48	144.00	92	529.00
9¼	5.34	49	150.06	93	540.56
9½	5.64	50	156.25	94	552.25
9¾	5.94	51	162.56	95	564.06
10	6.25	52	169.00	96	576.00
11	7.56	53	175.56	97	588.06
11.31	8	54	182.25	98	600.25
12	9.00	55	189.06	99	612.56
13	10.56	56	196.00	100	625
14	12.25	57	203.06		

American Photographic Societies

This list is compiled from information received from an inquiry form sent to the societies during the latter half of 1925. It includes many societies not given in the 1925 Annual, but falls short of completeness as a record of the photographic societies of America. Secretaries of societies not here listed are urged to send us particulars of their organization so that the list may be fully representative of society activities.—Editor.

THE ACADEMY OF SCIENCE AND ART OF PITTSBURGH PHOTOGRAPHIC SECTION, SPONSOR OF THE PITTSBURGH SALON—Headquarters. Carnegie Institute, Schenley Park. Organized January 23, 1900. Membership, 100. Meetings, second and fourth Tuesdays in each month at Carnegie Institute. *President,* O. C. Reiter, 2424 Penn Avenue, Pittsburgh, Pa.; *Vice-President,* N. S. Woolridge, 836 South Linden Avenue, Pittsburgh, Pa.; *Print Director,* S. A. Martin, 1011 Heberton Avenue, Pittsburgh, Pa.; *Lantern Slide Director,* Benjamin W. Robinson, 4246 Fifth Avenue, Pittsburgh, Pa.; *Secretary-Treasurer,* P. F. Squier, 237 Avenue B, Westinghouse Plan, East Pittsburgh, Pa. *Executive Committee,* C. E. Beeson, F. O. Van Gorder, W. C. Mellor, O. C. Reiter, P. F. Squier.

ASSOCIATED CAMERA CLUBS OF AMERICA—Headquarters, 45 Polk Street, San Francisco, Calif. *President,* Louis F. Bucher, Newark Camera Club; *Vice-President,* E. H. Brown, Dallas Camera Club; *Secretary,* W. C. Mackintosh, California Camera Club; *Treasurer,* H. W. Greene, Camera Club of Cincinnati; *Board of Directors,* Julius Cindrich, Southern California Camera Club; H. G. Cleveland, Cleveland Photographic Society; George W. Harting, Pictorial Photographers of America; John H. Kiem, Orange Camera Club; E. Roy Monroe, Portland, Me., Camera Club, and Paul T. Tarnoski, Chicago Camera Club; *Association Print Director,* Julius Cindrich, Los Angles, Cal. Motive—Closer affiliation of Camera Clubs, Annual exhibits, Interchanges of prints and slides, as well as ideas, literature and the general promotion of artistic photography through the medium of the Camera Club or Photographic Society. Membership, thirty-four clubs. Association organized May 1, 1919. Correspondence invited with non-member organizations and those desiring to form a club or society.

BLUE BELL CAMERA CLUB—Detroit, Mich. Headquarters, Bell Telephone Building, 1365 Cass Avenue. *President,* Wm. B. Kemp; *Vice-President,* G. W. Gale; *Treasurer,* H. D. Yankey; *Secretary,* Mrs. V. Archenbrown, 12387 Cloverlawn Avenue. Membership entirely within the organization of the Michigan Bell Telephone Co.

BOSTON CAMERA CLUB—Boston, Mass. Established 1881. Incorporated 1886. Membership, 75. *President,* P. Hubbard; *Secretary,* John H. Thurston, 234 Boylston Street.

BOSTON YOUNG MEN'S CHRISTIAN UNION CAMERA CLUB—Boston, Mass. Headquarters, 48 Boylston Street, Boston. Organized, 1908. *President,* William H. C. Pillsbury; *Vice-President,* Ralph Osborne; *Secretary,* Philip A. Palmer; *Treasurer,* Livingston Stebbins, 6 Beacon Street, Boston, Mass. Meetings first Tuesday each month at club rooms, 48 Boylston Street, Member Associated Camera Clubs of America.

BOULDER CAMERA CLUB—Care of University of Colorado, Boulder, Colo. *President,* Severance Burrage.

BROOKLYN INSTITUTE OF ARTS AND SCIENCES, PHOTOGRAPHIC SECTION—Headquarters, Academy of Music Building, Lafayette Avenue, Brooklyn, N. Y. Organized 1886. Membersip 75. Meetings for general discussion and criticism the second Monday each month except July and August. Courses in Rudiments of Photography, Advanced Photography, Pictorial Photography and Portraiture; Loan Exhibitions. Annual exhibit of the Department in May. Demonstrations of the various processes every third Friday evening. *President,* James W. Aughiltree; *Vice-President,* Sophie L. Lauffer; *Secretary,* A. Merrill Powers, 3427 Bedford Avenue, Brooklyn; *Treasurer,* J. Halstead Patterson; *Chairman Executive Committee,* William A. Alcock.

BUFFALO CAMERA CLUB—Buffalo, N. Y. Headquarters, 463 Elmwood Avenue. *President,* C. A. Pierman; *Vice-President,* Emil Strub; *Secretary,* Lester F. Davis; *Treasurer,* W. P. Hubbard, Member of Associated Camera Clubs of America.

CALIFORNIA CAMERA CLUB—San Francisco, Cal. Headquarters, 45 Polk St., San Francisco, Cal. Established March 18, 1890. Incorporated April 5, 1890. Membership 337. Date of meeting second Tuesday, monthly. Monthly print exhibitions and illustrated lectures. *President,* Horace Hirschler; *Secretary,* Graham Lee. Members of other clubs are cordially invited to visit our rooms when in San Francisco. Member Associated Camera Clubs of America. Salon announcements desired.

CAMERA CLUB, THE—New York. Club Rooms, 121 West 68th St. Established in 1884, and Incorporated in 1896 upon consolidation of The Society of Amateur Photographers of New York and The New York Camera Club. Membership 245. Annual Meeting first Thursday after the first Monday in January. *President,* Walter S. Gurnee, Jr.; *Vice-President,* Harrie T. Leonard; *Secretary,* Walter N. Capen; *Treasurer,* Wm. E. Wilmerding. Affiliated with The Royal Photographic Society of Great Britain.

"CAMERADS"—New Brunswick, N. J. Headquarters, corner Church and George Streets. Established April 24, 1890. *Secretary,* Harvey Iredell, D.D.S., Lock Box 34, New Brunswick.

CAMERA CLUB OF CINCINNATI—Cincinnati, Ohio. Club rooms and studio, 17, 18 and 19 Arno Building, Fourth and Sycamore Streets. Membership, 50. Meetings held on the first and third Mondays of each month. *President,* Dan Morganthaler; *Vice-President,* Robert P. Nute; Secretary, Charles A. Weddigen; *Treasurer,* Harry W. Greene. *Program Committee,* Harry Ohlenroth, chairman; Robert P. Nute and C. A. Weddigen, assistants. Member of the Associated Camera Clubs of America.

CAMERA CLUB OF THE SYRACUSE Y. M. C. A., THE. Organized December 16, 1922. Regular meeting the second Monday in each month, third floor, Y. M. C. A. *President,* Kent C. Haven; *Vice-President,* William L. Secas; *Treasurer,* George Barber; *Secretary,* J. O. Sprague, Y. M. C. A., Syracuse, N. Y.

CAMERA CLUB OF WATERBURY—Waterbury, Conn., P. O. Box 712. Organized Sept., 1919. Meets Monday evenings at the Y. M. C. A., Room 10, 136 West Main Street. *President,* Arthur H. Ganung; *Secretary,* Hollis M. French. Member Associated Camera Clubs of America.

CAMERA PICTORIALISTS OF LOS ANGELES—Los Angeles, Cal. Headquarters, 811 Washington Building. Association formed for strictly pictorial work; the holding of an annual International Salon; and for the good of the cause generally. Meeting, first Monday of month. *Director,* John C. Stick; *Secretary,* N. P. Moerdyke.

CAPE ANN CAMERA CLUB, INC.—Gloucester, Mass. Headquarters, 119 Main St. Organized 1897. Membership limited and filled (100). Meetings first and third Friday each month, or when called. Salons, April. *Secretary* Herman W. Spooner, 6 Proctor St., Gloucester, Mass. Completely equipped for all studio and enlargement work, also social functions, billiards, illustrated lectures, etc.

CENTRAL Y. M. C. A. CAMERA CLUB—Philadelphia, Pa. Founded 1898. Headquarters, 1421 Arch St. Meeting first Monday of each month. *President,* Bernard B. Wolff; *Vice-Presidents,* Richard E. Wilson, J. F. Jackson; *Secretary,* Charles R. Passehl. Member Associated Camera Clubs of America; affiliated with the Royal Photographic Society of Great Britain.

CHAFFEY CAMERA CLUB—Ontario, Upland, Cal. Headquarters, Chaffey Library. *President,* Carlyle Sampson; *Secretary-Treasurer,* Paul Moore; *General Manager,* W. A. Fiske. The Club meets every second Tuesday evening of each month.

CHICAGO CAMERA CLUB—Chicago, Ill. Headquarters, 31 W. Lake Street. Established February 14, 1904. Incorporated February 19, 1904. Meetings every Wednesday. *President,* Joseph Simons; *Vice-President,* W. A. Ball; *Secretary,* C. C. Bohm; *Treasurer,* W. D. Hughes. Member Associated Camera Clubs of America.

CLEVELAND PHOTOGRAPHIC SOCIETY—Cleveland, Ohio. Clubrooms, third floor Rathskeller Building, 2046 East Fourth Street. Established June 7, 1913. Permanent organization effected at meeting of June 18. Incorporated October 9, 1920. Meetings every Wednesday evening at 8 o'clock. *President,* Ralph D. Hartman; *Vice-President,* Giraldus Roach; *Financial Secretary,* B. E. Clarkson; *Corresponding Secretary,* R. L. Barrett; *Treasurer,* G. Y. Tange. Member Associated Camera Clubs of America.

COLUMBIA PHOTOGRAPHIC SOCIETY—Philadelphia, Pa. Headquarters, 4605 Germantown Avenue, Philadelphia. Established 1889. Incorporated July 3, 1894. Membership, 50. Business meeting first Monday of each month; other Mondays, lectures or demonstrations. Member Associated Camera Clubs of America. *President,* J. P. Mudd; *Vice-President,* J. L. Hanna; *Secretary-Treasurer,* H. O. Sauer.

DALLAS CAMERA CLUB—1707½ Elm St., Dallas, Texas. Organized July 20, 1921. *President,* Dr. W. H. Matthews; *Vice-President,* H. M. Sutton; *Secretary,* G. Jules Dullnig. Monthly bulletin "Proofs"; *Editor,* E. H. Brown. Meetings on first and third Tuesdays of each month. Monthly competition. Annual exhibition. Member of Associated Camera Clubs of America.

DARTMOUTH CAMERA CLUB—Headquarters, 7-8 Robinson Hall, Hanover, N. H. Organized, 1915. Membership, 30. *President,* Harvey Jones, All communications addressed to Prof. Leland Griggs, Hanover, N. H. Member Associated Camera Clubs of America.

DENVER CAMERA CLUB, THE—Denver, Colo. Headquarters, Chappell House, 1300 Logan Street. Incorporated Jan. 1, 1923. *President,* Clark Blickensderfer; *Vice-President,* Harold D. Roberts; *Secretary,* Katharine Bruderlin, 1276 Emerson Street, Denver; *Treasurer,* William F. Ervin. The Club is affiliated with the Denver Art Association and has its club rooms and dark rooms in the home of this association. Membership in the Denver Camera Club entitles the members to all privileges of the Art Association.

ELYSIAN CAMERA CLUB—307 Washington Street, Hoboken, N. J. Established 1902. Date of meeting second Thursday of each month. Membership, 45 Active, 3 Associate, 7 Honorary. *President,* Richard Reynolds; *Vice-President,* Charles Westerburg; *Treasurer and Corresponding Secretary,* George Sting; *Recording Secretary,* Paul Eickhorn.

FORT DEARBORN CAMERA CLUB—Chicago, Ill. Headquarters, 136 West Lake Street. Meetings every Friday. Print criticism, first Friday in each month. Business meeting, last Friday in each month. Photo hikes every Sunday. *President,* Ralph S. Hawkins; *Vice-President,* Algot V. Nelson; *Secretary,* C. Frankenberger; *Treasurer,* J. W. Russell.

GRAND RAPIDS CAMERA CLUB—Grand Rapids, Mich. Studio, 230 Fulton Street, East, care Grand Rapids Art Gallery, where demonstrations and inspiring meetings are held Thursday evenings from September to June inclusive, with occasional field days during the summer months, and monthly hikes during the balance of the year. Exhibits the last Thursday in each month. *President* A. G. Kalmbach; *Vice-President,* Miss Vera Bennett; *Secretary,* Miss Helen E. Hitchcock; *Treasurer,* Miss Frances Fritz; *Director,* Raymond B. Ryan. Annual meeting the third Thursday in June. Member Associated Camera Clubs of America.

HIGHLAND PHOTOGRAPHIC CLUB—Holyoke, Mass. *President,* Francis H. King; *Vice-President,* Halford T. Wheeler; *Treasurer,* Francis W. Bennett; *Secretary,* Ernest D. Krause. Club meets in the home of the Treasurer once a week. The club was organized on February 2, 1924. All correspondence is to be addressed to Francis W. Bennett, 7 Orchard Street, Holyoke, Mass.

INTERNATIONAL PHOTOGRAPHIC ASSOCIATION — San Francisco, Cal. Founded 1908. *President,* F. B. Hinman, Evergreen, Jefferson County, Colo.; *Chief Album Director,* Louis R. Murray, 927 Ford Street, Ogdensburg, N. Y.; *Director Post Card Albums,* John Bieseman, Hemlock, Ohio; *Director Stereoscopic Division,* Lovic Meredith, Rupperttown, Tenn.; *Album Directors*: Eastern Division, No. 1—Under the direction of Franklin Gray McIntosh, *Album Director,* 1520 Liberty Street, Franklin, Pa.; Henley H. Hall, *Secretary,* 511 West Thirty-second Street, Richmond, Va., comprises New York, New Jersey, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Delaware, Virginia, West Virginia, Kentucky, Indiana, Ohio and Michigan. Western Division, No. 2—Under the direction of Allen Young, Room 411, Claus Spreckels Building, San Francisco, Cal., comprises California, Oregon, Washington, Idaho, Nevada, Utah, Montana, Wyoming and Colorado, Southern Division, No. 3—Under the direction of Frank Reeves, Stamford, Texas, comprises Florida, Georgia, North Carolina, South Carolina, Tennessee, Mississippi, Alabama, Louisiana, Arkansas, Oklahoma, Texas, New Mexico, and Arizona. Northern Division, No. 4—Under the direction of Leonard A. Williams, 622 Second Ave., St. Cloud, Minn. This division comprises Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota and South Dakota.

KANSAS CITY CAMERA CLUB, 1925-26—Suite 307, Bryant Building, Kansas City, Mo. Organized 1914. Club meets second Monday of each month. Annual exhibition in February. *President,* Dr. A. H. Cordier; *Vice-President,* Val. B. Mintun; *Secretary-Treasurer,* Dr. Maclay Lyon.

KODAK PARK CAMERA CLUB—Eastman Kodak Co., Kodak Park, Rochester, N. Y. Organized Jan. 6, 1920. *President,* Frank L. Wadman; *Vice-President,* Dr. R. H. Lambert; *Treasurer,* R. P. Loveland; *Secretary,* Miss Elsie Garvin; *Assistant Secretary,* Emily Seidl; *Recording Secretary,* Teressa Zick. Meetings on first Thursday from September to May, inclusive. Hikes each month. Annual exhibition in Rochester Memorial Art Gallery and at Kodak Park. Exhibits exchanged with other clubs. Member of Associated Camera Clubs of America.

LOWELL Y. M. C. A. CAMERA CLUB—Lowell, Mass. *Secretary,* N. R. Farnum.

MILLVILLE HIGH SCHOOL CAMERA CLUB—Organized under the direction of Prof. J. A. Ernest Zimmermann. Membership, 40, consisting of students, faculty and alumni. *President,* Thomas S. Shea; *Vice-President,* Florence Cassidy; *Secretary-Treasurer,* Rebecca Sherry. Club meets every second and fourth Tuesday of the month. It also conducts an annual photographic contest.

MILWAUKEE CAMERA CLUB—Milwaukee, Wis. Headquarters, Milwaukee Art Institute, 450 Jefferson Street. Meetings every Wednesday evening. *Presi-*

dent, John A. Jeske; *Vice-President,* E. D. Studley; *Treasurer,* M. E. Baumberger; *Secretary,* P. VanBeek, 3222 North Avenue; *Librarian,* Robert H. Meyer. Member of Associated Camera Clubs of America. Photo exhibits at the Milwaukee Art Institute throughout the year with one general exhibit in April in connection with the Wisconsin Painters and Sculptures.

MOLINE Y. M. C. A. CAMERA CLUB—Headquarters, Moline, Ill.

MONTREAL AMATEUR ATHLETIC ASSOCIATION CAMERA CLUB—Montreal, Canada. Headquarters, M. A. A. B. Building, 250 Peel Street. Organized May 1, 1906. *President,* W. Gordon Wright *Vice-President,* P. F. Calcutt; *Secretary,* P. J. B. Brass. Exhibitions: Annual, April; Provincial, November.

NEWARK CAMERA CLUB (Inc.)—27 Franklin Street, Newark, N. J. Organized, 1888. Incorporated, 1910. Meeting nights, second and fourth Mondays of each month. Motto, "Something of Interest Every Monday Night." Member and organizer of Associated Camera Clubs of America. Visitors welcome. *President,* Louis F. Bucher; *Vice-President,* Otto A. Ledig; *Secretary,* William L. Woodburn: *Treasurer,* Julius F. Graether. Club bulletin, "The Ground-Glass," issued monthly.

NEW BRITAIN CAMERA CLUB—New Britain, Conn. Headquarters, 169 Main Street. Organized, 1892. *President,* W. B. Rossberg; *Vice-President,* E. H. Start; *Secretary-Treasurer,* Paul A. Stahl, 260 Corbin Avenue, New Britain, Conn. Meets first and third Tuesdays. Member Associated Camera Clubs of America.

NEW HAVEN CAMERA CLUB—17 Broadway. Organized 1911. Membership, 41. *President,* William R. Frisbie; *Vice-President,* Charles Koeberle; *Secretary-Treasurer,* Frederick A. Musch, 25 Wakefield St., New Haven, Conn. Meetings first Thursday of month, except on holidays and then second Thursday. Member Associated Camera Clubs of America.

ORANGE CAMERA CLUB—East Orange, N. J. Headquarters, Main and Clinton Streets. Established March 21, 1892. Incorporated May 19, 1893. Membership, 120. Date of meetings, first and third Saturdays of each month, except July, August and September. *President,* John H. Kiem, *Secretary,* J. Halsted Fountain, Main and Clinton Streets, East Orange, N. J.

OREGON CAMERA CLUB—Portland, Oregon. Headquarters, 507 Abington Building. Established 1895. Incorporated 1903. Membership, 75. Annual meeting, first Tuesday in January. *President,* Walter H. Leve; *Secretary,* J. Verne Shangle; *Treasurer,* Maurice Saelens. Annual exhibit, in Spring. Member Associated Camera Clubs of America.

PHOTOGRAPHIC CLUB OF BALTIMORE CITY—Baltimore, Md. Headquarters, Photographic Section Maryland Academy of Sciences, 105 West Franklin Street. Established 1885. Incorporated 1890. Membership, active, 50. Meetings, second Tuesday in month. *President, E. M. Barker; Vice-president,* Henry M. Walker; *Secretary,* A. L. Sanders; *Treasurer,* Milton Kurtz; *Curator,* J. Lee Tormey. Member Associated Camera Clubs of America.

PHOTOGRAPHERS' GUILD OF THE SOCIETY OF ARTS AND CRAFTS—Boston, Mass. *Dean,* William H. C. Pillsbury; *Secretary and Treasurer,* Ralph Osborne; *Councilors,* Mrs. Dorothy Jarvis and Mrs. Sarah Knapp Russell. Organized Feb. 18, 1916. Meetings held at members' studios.

PHOTO PICTORIALISTS OF CINCINNATI—Cincinnati, Ohio. Organized 1920. Work devoted to advancement of pictorial photography. Membership, six. Meetings on call only. Charles H. Partington, director; G. A. Ginter, Robert P. Nute, Charles A. Weddigen, Harry W. Green, Peter Scherrer. Address communications to the director, 4113 Thirty-second Street.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA—Philadelphia, Pa. Headquarters, 1615-1617 Sansom Street. Established November, 1862. Incorporated April 24, 1885. Membership, 100. Date of meetings; Members, second Wednesday. *President,* Dr. Robert F. Ridpath; *First Vice-President,* A. Crawford Allison; *Second Vice-President,* John Allen.; *Secretary,* E. A. McKinley, 1615 Sansom Street; *Treasurer,* J. J. Baylson. Date of members' annual exhibition, March. Member Associated Camera Clubs of America.

PICTORIAL PHOTOGRAPHERS OF AMERICA—New York City. Headquarters, Art Center, 65 East Fifty-sixth Street. Meetings, first Monday evening in each month from October to June. Officers for 1925: *President,* George William Harting, 51 West Tenth Street; *Resident Vice-President,* Mrs. Antoinette B. Hervey; *Honorary Vice-Presidents,* Prof. Charles F. Chandler*, Gertrude Kasebier, Clarence H. White*; *Secretary,* Dr. Arthur Nilsen, 55 West Tenth St.; *Treasurer,* Jerry D. Drew, 83 Cliff Street; *Regional Vice-Presidents,* Clark Blickensderfer, Denver; Edwin Franklin Dreher, Seattle; Frank R. Fraprie, Boston; Forman G. Hanna, Globe, Ariz.; Anson Herrick, San Francisco; George Henry High, Chicago; Francis Orville Libby, Portland, Me.; J. H. Mackay, Toronto, Canada; Oscar C. Reiter, Pittsburgh; John C. Stick, Los Angeles, J. Vanderpant, New Westminster, B. C., Canada. Member Associated Camera Clubs of America. Affiliated with Royal Photographic Society of Great Britain.

---

*Deceased.

PICTORIAL PHOTOGRAPHIC SOCIETY OF SAN FRANCISCO, CAL.—*Director,* Anson Herrick; *Vice-Director,* L. A. Goetz; *Secretary-Treasurer,* G. H. S. Harding, 564 Market Street, San Francisco; *Secretary Salon Committee,* H. A. Hussey, 64 Pine Street, San Francisco.

PITTSBURGH SALON, THE—Pittsburgh, Pa. Under auspices of Photographic Section of the Academy of Science and Art. Membership consists of the leading pictorialists of the United States. *President,* O. C. Reiter, 2424 Penn Ave.; *Vice-President,* N. S. Woolbridge, 636 South Linden Ave.; *Print Director,* S. A. Martin, 1011 Heberton Avenue; *Lantern Slide Director,* Benjamin W. Robinson, 4246 Fifth Avenue, Pittsburgh, Pa.; *Secretary-Treasurer,* P. F. Squier, 237 Avenue B, Westinghouse Plan, East Pittsburgh, Pa.

PORTLAND CAMERA CLUB PHOTOGRAPHIC SECTION OF THE PORTLAND SOCIETY OF ART—Portland, Me. Headquarters, L. D. M. Sweat Memorial, Spring, corner High Street. Established 1899. Membership, 88. Date of meetings every Monday evening. *President,* Harvard M. Armstrong, Cape Elizabeth; *Vice-President,* Frank D. Sampson, 30 Galvin Street; *Exhibition Committee,* E. Roy Monroe, 36 Exchange Street; Alfred Brinkler, 104 Park Street; Floyd Grant, 768 Congress Street. Member Associated Camera Clubs of America.

READING CAMERA CLUB—Reading, Pa. Headquarters, 610 Court Street. Established 1913. Meetings first and third Thursdays of each month. Quarterly exhibits for members only. Annual exhibit early in March. *President,* Harrison N. Mucher; *Secretary,* Earl F. Young, 427 Woodward Street, Reading, Pa.

SAN DIEGO Y. M. C. A. CAMERA CLUB—San Diego, Cal. Organized January, 1920. Headquarters, Y. M. C. A., San Diego, Cal. *President,* Homer C. Miller; *Vice-President,* I. N. Lawson, Jr.; *Treasurer,* Roland E. Schneider; *Secretary,* R. E. Vandruff. Annual exhibition in October. Member Associated Camera Clubs of America. Annual election of officers January.

SEATTLE CAMERA CLUB, Seattle, Wash. Headquarters, 422½ Main Street. Organized 1924. *Chairman,* Dr. K. Koike; *Executive Secretary,* Y. T. Iwasaki; *Treasurer,* F. A. Kunishige.

SOUTHERN CALIFORNIA CAMERA CLUB (of the Southwest Museum, Inc.) 108-12 Stimson Bldg., 129 West Third Street, Los Angeles, Cal. Membership, 100. *President,* R. L. van Oosting; *Vice-President,* Julius Cindrich; *Secretary,* Evelyn McDowell; *Treasurer,* N. L. Ridderhof. Officers elected second Tuesday in December. Meetings, Thursday nights, open to the public. Member Associated Camera Clubs of America. Fourth Annual "Southwest Salon" will be held at Southwest Museum early in 1926. As before, will be open only to Rocky Mountain and Pacific Coast states. Please send notices of contests, exhibitions, etc.

ST. LOUIS CAMERA CLUB—St. Louis, Mo. Organized February 12, 1914. Devoted to the interest and advancement of the art of photography. Meetings every first and third Thursdays at 8 p. m., Barr Branch Library, Jefferson and Lafayette Avenues. *President,* O. C. Kuehn; *Vice-President,* R. L. Jungling; *Secretary,* C. J. Fecht, 3640 South Grand Blvd., St. Louis, Mo. Address all communications to the secretary. Member Associated Camera Clubs of America.

SWAIN CAMERA CLUB—New Bedford, Mass. *Secretary and Treasurer,* Herbert J. Harper, 95 Walden Street, New Bedford, Mass.; *Lantern-slide and Print Director,* J. Arnold Wright, 27 Jenny-Lind Street, New Bedford, Mass.

TRIPOD PICTORIALISTS—Covina, Cal. Meet at intervals of two weeks at the homes, or studios of members. *President,* Clarence West Tucker; *Secretary,* Fred William Carter, Valencia Place, Covina, Cal. New members admitted by vote of the present members only, and must be of recognized pictorial ability.

UTAH CAMERA CLUB—Salt Lake City, Utah. *President,* Geo. I. Reeves; *Secretary,* Thomas O. Sheckell, 1411 Walker Bank Building.

WESLEY CAMERA CLUB—Headquarters, Bell Theater Building. Organized April 6, 1912. Meeting the first Monday of each month. *President,* Lester Lease; *Vice-President,* H. H. Flom; *Secretary and Treasurer,* W. A. Drewelow, Wesley, Iowa.

WILKES-BARRE CAMERA CLUB—Wilkes-Barre, Pa. Headquarters, 131 South Main Street. Organized 1901. Meet every Tuesday evening. *President,* C. N. Woelever; *Secretary,* W. E. Carpenter; *Treasurer,* Joseph Hogarth. Member Associated Camera Clubs of America.

WORCESTER POLYTECHNIC INSTITUTE CAMERA CLUB—Worcester, Mass. Headquarters, Mech. Eng. Bldg. Organized in December, 1921. *President,* J. C. Spur; *Vice-President,* W. T. Wentworth; *Secretary-Treasurer,* F. H. King, 147 Highland Street.

YONKERS CAMERA CLUB—Yonkers, N. Y. Headquarters, 782 Warburton Avenue, *President,* W. R. Cronk; *Vice-President,* Wm. Beck; *Secretary,* Elijah F. Munn, 11 Van Cortland Park Avenue, Yonkers, N. Y.; *Librarian,* C. B. Carling; *Trustees,* F. W. Wocher, Wm. D. Mitchell, Geo. H. Stengel.

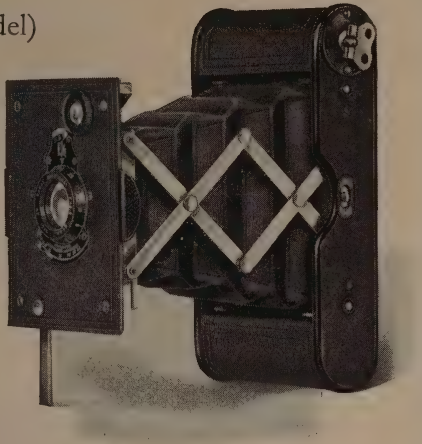
Vest Pocket Autographic Kodak, *Special*

(Focusing Model)

with Kodak Anastigmat lens *f*.6.9
$15

with Kodak Anastigmat lens *f*.7.7
$13

Pictures 1⅝ x 2½



So Small You Can Wear It

Here is a Kodak that can always go with you no matter how light you travel. Put it in the pocket—the *vest* pocket—slip it in the handbag—there's room always.

Vest Pocket Kodak *Specials* with their Kodak Anastigmat lens equipments give you sharp, clean-cut negatives that yield not only sparkling contact prints but splendid enlargements as well. And a mere turn of the lens mount sets these lenses in accurate focus for any of ten distances down to three feet—from distant views to "close-ups."

Two snap-shot speeds, 1/25 and 1/50, with the smooth working Kodak Ball Bearing Shutter, as well as time and bulb actions.

EASTMAN KODAK COMPANY
ROCHESTER, N. Y., *The Kodak City*

At your dealer's

To Challenge the Difficult Situation Use

Kodak Cut Film

Super Speed

For the enthusiastic photographer who makes snapshots under unfavorable light conditions, Kodak Cut Film *Super Speed* is indispensable. It meets the problem—gets the picture difficult for films or plates of ordinary speed.

And further, as compared with plates, Kodak Cut Film *Super Speed* is light in weight, unbreakable, and practically free from halation.

By means of Kodak Cut Film Sheaths, Kodak Cut Film may be used in plate holders including those for the Nos. 3 and 3A Kodaks, when equipped with the Combination Back.

Prices

	2¼x3¼	3¼x4¼	3¼x5½	4x5	5x7
Kodak Cut Film, *Super Speed*, doz.	$0.52	$0.77	$1.03	$1.03	$1.65
Kodak Cut Film, regular speed, doz.	.46	.67	.93	.93	1.50
Kodak Cut Film Sheath, each .	.10	.10	.15	.15	
Graflex Cut Film Holder	1.75	2.50	2.50	2.50	3.50
Graflex Cut Film Magazine . .	12.00	14.00	15.25	15.25	17.00
Eastman Film Sheath No. 3 each					.20
Combination Back for No. 3 or 3A Kodak					4.00
Combination back for No. 3 *Special*					4.50
Ditto for No. 3A *Special*					5.00
Double Plate Holders for any of the above					1.50

Prices of Film include Excise Tax

EASTMAN KODAK COMPANY
ROCHESTER, N. Y., *The Kodak City*

At your dealer's

Ciné-Kodak, Model B is held waist height—the only position where undue movement of the camera may be prevented.

And Now—

CINÉ-KODAK

Model B

A hand camera that makes motion pictures

The Ciné-Kodak, Model B, makes motion pictures just as easily as your other Kodak makes snapshots.

Ciné-Kodak, Model B, weighs five pounds loaded—is but slightly larger than a 3A Kodak closed. It's fixed focus—just point the lens at the subject, press the lever and the spring motor cranks the camera. Film capacity permits either 50 or 100 foot lengths.

Everywhere action for motion pictures, and the Ciné-Kodak gets it; precious memories or reels of a day's excitement—later and often repeated at home on the screen.

Price $70

Ciné-Kodak Booklet by mail on request

EASTMAN KODAK COMPANY
ROCHESTER, N. Y., *The Kodak City*

Revolving Back
Auto Graflex

3¼ x 4¼
4 x 5

Any Graflex is a versatile camera but the Revolving Back Auto Graflex is the most widely useful of all. Its unusual bellows capacity means generous-size close-ups of small objects and permits the use of a convertible lens' single element for distant scenes.

Far-away or at short range, this camera can make a big image, full of the snap and sparkle that characterize Graflex pictures. And in making big images the revolving back and rising front are definite aids toward attractive composition.

While the Revolving Back Auto Graflex is obtainable without lens, it is also offered with 7½-inch Kodak Anastigmat *f*.4.5 on the 3¼ x 4¼ model at $161; 10-inch Kodak Anastigmat *f*.4.5 on the 4 x 5 model at $225.

Ask your dealer or write for a catalog

EASTMAN KODAK COMPANY
Folmer & Schwing Department Rochester, N. Y.

VITAVA

A Complete Line of Papers
for Distinctive Photography

Vitava now offers the photographer a paper of the highest quality for portraiture, for portrait enlarging, for pictorial or commercial work.

Of the portrait or pictorial papers, the Athena, Old Master surface, is probably most distinctive. The texture, the tone and the brilliancy of this paper combine to produce an effect that is as unusual as it is pleasing. Athena is also supplied in the familiar A, B, C, D, E Rough, E Smooth, E Semi-matte and Linen Finish surfaces—at your dealer's.

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

Art Corner Your Pictures in an **Album**

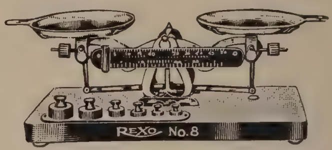
where you can keep them safe and enjoy them always.

5 Styles **Engel "Art Corners"** 5 Colors

are on sale at Photo Supply and Album counters everywhere. They are the only Quick, Easy, Artistic, No Paste, No Fold way to mount Kodak Prints, Greeting and Souvenir Cards, Clippings, etc., on anything, anywhere. A dime brings 100 and samples to try. Write

10¢ Buys 100

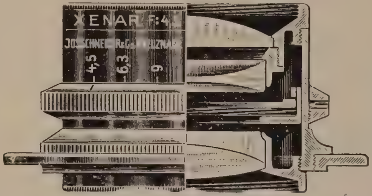
ENGEL ART CORNERS MFG. CO.
4711 N. Clark Street Dept. AA Chicago



Photographer's Scale

Sensitive to a grain, yet so simple, anyone can operate it—dependable—weighs in both avoirdupois and metric systems—graduated from 1 to 50 grains and from 1 to 30 decigrams. Send for sample. Beautifully made.

PELOUZE MANUFACTURING CO.
232 E. Ohio Street **Chicago**



F/4.5 Xenar F/3.5

JOS. SCHNEIDER & CO.

FULLY CORRECTED ANASTIGMAT LENSES. NOTED FOR CRISP DEFINITION AND BRILLIANCY

Free trial for comparison against lenses of double the price.

Write Dept. S for catalogue and price list.

Sole Agent U. S.

BURLEIGH BROOKS
136 Liberty Street **New York City**

Model A 110-V. A.C. $18.00.

Gilbert Electric Retoucher

"The Little Speedster"

For Negatives and Prints. Speeds up your retouching. Does expert work. Saves time. Saves money. Costs little to run. Will soon pay for itself. THIS DEVICE gives the "touch" by automatic double vibration produced by an oscillating vibrator. Patented U. S. and Canada. *Geo. G. Holloway* says: "One of the best inventions Photography has had the good fortune to meet with; most useful." New model much improved, quiet and efficient.

GILBERT SUPPLY COMPANY, Independence, Iowa

Everything Photographic—

Special Equipment—Enlargers
Imported Cameras and Lenses—Printers
for the
AMATEUR and PROFESSIONAL
Write for Latest Bulletin. Call When in New York
WILLOUGHBY'S
110 West 32nd St., New York

Covers the whole Field of Photography

AMATEUR PROFESSIONAL
PICTORIAL COMMERCIAL

KNOWN THE WORLD ROUND
BECAUSE OF ITS SCOPE
SUPERBLY ILLUSTRATED
15 Cents a Copy *$1.50 a year*

Camera Craft Publishing Company
703 Market Street - - San Francisco, California

WYNNE'S INFALLIBLE EXPOSURE METER

The Wynne's Infallible Exposure Meter has been specially designed to attain the maximum of simplicity, convenience and efficiency, with a minimum of diameter and thickness of case—the case being only one-quarter of an inch in thickness. It is beautifully made in the best Solid Nickel and opens automatically by pressure of the small knob on the pendant.

Wynne's Exposure Meter $3.75
Autochrome Scale and Instruction Book...... .50

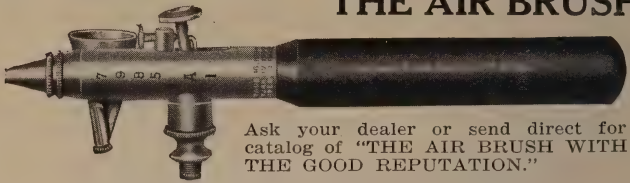
American Agents

GEORGE MURPHY, Inc. 57 E. 9th St., New York City

EAGLE
MIKADO
No. 174
174 EAGLE MIKADO No 2 EAGLE PENCIL CO. NEW YORK U.S.A.
The YELLOW PENCIL with the RED BAND
EAGLE PENCIL CO. NEW YORK, U.S.A.
REG. U.S. PAT. OFF. CANADA & OTHER COUNTRIES
MADE BY THE LARGEST PENCIL FACTORY IN THE WORLD

The Studio Requisite

THE AIR BRUSH



Ask your dealer or send direct for catalog of "THE AIR BRUSH WITH THE GOOD REPUTATION."

THE WOLD AIR BRUSH MFG. CO.

2173 N. California Ave. **CHICAGO, ILL.**

FREE *A 32-page monthly magazine* **(Snap Shots)**

devoted exclusively to photographic matters. A postal will bring it to you.

36th year of publication.

GEORGE MURPHY, INC., 57 East 9th St., New York

Everything Photographic

Photography pays as high as $250.00 per week

PORTRAITURE
COMMERCIAL
MOTION PICTURE

You can easily qualify for high salaried position, or start in business on small capital. Residence or correspondence courses.

Correspondence Plan

You can learn at home in spare time Portraiture, Motion Picture, Press and Commercial Photography. Motion Picture Camera taking standard size film or 5 x 7 professional view camera with anastigmat lens

GIVEN FREE

For correspondence instruction write for Catalogue C-63.

143 W. 36th St.
New York, N. Y.

Residence Instruction

New York and Chicago schools give classroom instruction under capable and recognized experts. Individual and practical instruction in all branches: Portraiture, Commercial, Motion Picture and Press photography. If interested in resident instruction write nearest school for

FREE BOOK R-63

NEW YORK: 141 W. 36th St.
CHICAGO: 630 So. Wabash Ave.

New York Institute of Photography

NEW YORK **CHICAGO**

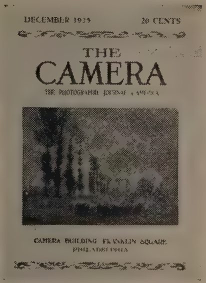
GEVAERT

Photographic Products of Perfection

PAPERS
PLATES
CUT FILMS
ROLL FILM

Descriptive literature upon request.

THE GEVAERT COMPANY OF AMERICA, INC.
423-439 West 55th St. New York City



is the Photographic Magazine

For Beginners and Advanced Amateurs

It brings just the help, criticism, and inspiration needed by the amateur.

For Technical Photographers

It presents the latest discoveries, experiments, and discussions of the world in scientific photography.

For Pictorialists

It culls the photographic exhibitions and places before its readers, each month, a feast prepared by the leading pictorialists of the world.

For in its reading pages, its illustrations, its Print Criticisms, its Questions and Answers, and its Technical and Scientific Notes, THE CAMERA is a constant source of photographic inspiration.

$2.00 per year in United States and Canada
$2.50 elsewhere

Judge THE CAMERA on its own merits—send for a specimen copy

THE CAMERA PUBLISHING COMPANY
CAMERA BUILDING PHILADELPHIA, PA., U. S. A

Holliston Photo-Cloth—

For Backing Photographs

This method of backing photographs quickly and cleanly without fuss or muss will increase your production and lower your costs because:

Holliston Photo-Cloth is self-adhesive and requires no paste—and it comes to you already cut in standard sheet sizes. It eliminates the labor, expense and waste of cutting the cloth piece by piece to the proper size and the slow and mussy operation of pasting.

Holliston Photo-Cloth produces clean, perfect prints—free from paste lumps, smudges and blisters. Photographs backed with Photo-Cloth are flexible yet firm and they will not curl or fray at the edges.

Prove this with your own hands in your own studio—write for samples, prices and a descriptive folder.

THE HOLLISTON MILLS, Inc., Norwood, Mass.

Boston, 531 Atlantic Avenue
New York, 32 West 18th Street
Chicago, 633 Plymouth Court
St. Louis, 311 No. Second Street

A new art for coloring photographic prints and enlargements

"CASTELL"

Polychromos Pencils

This new method of coloring photographs produces really marvelous results. It is used extensively by the professional photographer for the coloring of portraits. Lifelike results can be produced. The new process, which is extremely simple, is also used by amateurs for the coloring of landscapes, the results being superior to the old water or oil color method. The pencils are made in 62 different brilliant shades and are also furnished in assortments containing from six to sixty different pencils.

"CASTELL"

A. W. Faber "Castell" Pencils and Leads for Retouching are now made for retouching positives as well as negatives. Send for circulars.

A. W. FABER, Inc. **Newark, N. J.**

HIGGINS' PRODUCTS

For Photographers

HIGGINS' PHOTO-MOUNTER

An easily workable, smooth spreading adhesive of remarkable tenacity for the highest class of mounting work. Positively will not warp, cockle or discolor any mounting, no matter how delicate. In 3, 6, 14 and 32 oz. screw-capped jars.

HIGGINS' VEGETABLE GLUE

Commercial photographers doing a great deal of mounting work will find in Higgins' Vegetable Glue a semi-fluid adhesive of great strength at a price which is most reasonable. In ½ lb., 1 lb., 2 lb., 5 lb. and 10 lb. cans.

HIGGINS' WHITE INK

An opaque, waterproof ink, admirably adapted to marking negatives and for photo retouching. Will lie well and show up sharply on any colored mounting. Available in ¾ oz. bottles only.

Reliable photo supply houses the world over carry HIGGINS' products in stock

Made Only by

CHAS. M. HIGGINS & CO.

271 Ninth Street, Brooklyn, N. Y., U. S. A.

Chicago London

—*after all*

a lens is only as good as the photograph that it is capable of producing. Recognized quality is the reason that Wollensak Lenses are the choice of the eminent and discriminating photographer.

Descriptive catalog at your request.

WOLLENSAK

OPTICAL COMPANY

ROCHESTER, NEW YORK

MEDO PHOTO SUPPLY CORP.

The photo shop with a future

Professional apparatus of all descriptions and manufactures

SERVICE

COURTESY

EFFICIENCY

A. H. Niemeyer, President

Phones Chickering 3843-44—3506

223-225 West 46th St., New York City

Mail orders promptly executed

Abundant Operating Light Whenever You Need It

IS ASSURED BY KEEPING ALWAYS AT HAND A SUPPLY OF

Victor Flash Powder

"The Light That's Always Available"

The *Normal Grade,* a quiet burning powder of unsurpassed illuminating power, and of only 1/38th of a second duration, supplies an ideal exposure-light for every conceivable class of negative-making. Made also in Portrait, Extra Fast and Slow (Soft) Grades. The cost per negative is a negligible item. There is scarcely a day but you can profitably use it.

We manufacture also a complete line of highest quality Hand Flash Lamps, Standard Supported Open Flash Lamps, Smoke Confining Flash Bags, and Studio Flash Cabinets

Jas. H. Smith & Sons Company, 1229 South Wabash Ave., Chicago, Ill.

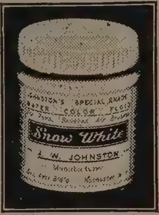
It is the "Ideal" White Ink for Photo Needs!

Now Recognized as the Standard **JOHNSTON'S** *Sold Regularly for Ten Years*

MADE IN U. S. A. **Snow White** KNOWN ABROAD

Border Designs Supplied **WHITE INK** *Film Folders Supplied*

For use either as a White Ink, White Water Color and Air Brush Spray, with Pens, Brushes, and Air Brushes. Equally serviceable as a base for making all tint colorings. Four different uses.



(½ oz. 25c.)

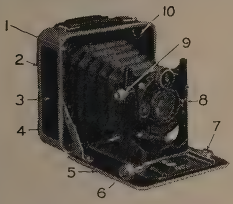
Excellent for Marking Dark Photo Books, Mounts, Films, Negatives. Also excellent for Retouching Purposes. Writes White. Prints White. Adheres firmly. Will not powder nor rub off. A real opaque.

[At Better Dealers Generally or Direct from Manufacturer]

Original **J. W. JOHNSTON** *Standard*

20 NEW ARTS BLDG. *(Manufacturer)* ROCHESTER, N. Y.

[PLEASE MENTION "AMERICAN ANNUAL OF PHOTOGRAPHY"]



TEN POINTS *of* PERFECTION

Kern AARAU

Made in Switzerland

We distribute in U. S. A. the full line of

KERN CAMERAS

Bijou Precision Sport Simplo

KERN LENSES

for Every Purpose

100 years devoted to precision manufacture—
Identified by this Trade Mark

Write for Catalogue:

R. W. CRAMER & COMPANY, INC.

136 Liberty Street **New York, N. Y.**

Mezzotint Black Platinum

The Printing Medium De Luxe

Warm Black Tones on Smooth and Rough India Stock

How often have customers reminded or shown you an advertisement wherein developing paper prints were offered at a ridiculously low price. Show them portraits printed on platinum paper. They tell a story of quality and value. The cheap man hesitates to use platinum paper because he knows it is too expensive. True it is more expensive than developing papers; but the simplicity of the process, and the non-curling quality outbalance this extra cost. For the professional photographer who demands a price commensurate with his knowledge, experience and overhead, platinum paper is the logical solution.

This and Other Platinum Papers on Various Stocks

Made in the U. S. A. by the

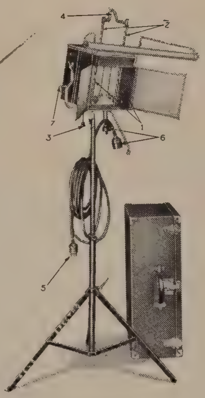
WALLACE CHEMICAL COMPANY

Richmond Hill, N. Y. **N. Y. Office, 100 Fifth Avenue**

Prices and direction sheets on application

The Gelb Spectro Junior

Portable Lamp No. 121



The Lamp You Have Wanted for Years. By special arrangement we offer this All Purpose Lamp on ten days trial. Then arrange terms.

Price complete as illustrated, $65.00

Write Dept. 57 for Descriptive Circular

MANUFACTURED BY

JOS. GELB COMPANY

250 WEST 54TH STREET
NEW YORK CITY

An unusual collection of Oriental and European Papers, including Japanese Tissues, Japanese Vellum Papers, Soft Japanese Papers for sensitizing, Cards and European Handmade Papers in great variety for folders and mounts.

A visit to one of the offices will convince you of the many ways in which you can utilize—and achieve distinction thereby—the large variety of papers carried in stock by the

JAPAN PAPER COMPANY

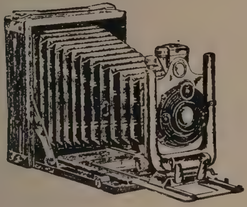
Established 1901

Importers of High Grade Papers from JAPAN, CHINA, KOREA, FRANCE, ITALY, ENGLAND, SPAIN, SWEDEN, HOLLAND, BELGIUM, SWITZERLAND, GERMANY, AUSTRIA, INDIA AND CZECHO-SLOVAKIA

109 East 31st Street, New York

709 Witherspoon Building
Philadelphia, Pa.

453 Washington Street
Boston, Mass.



THE WORLD'S BEST makes in cameras and lenses for the amateur worker or for the professional studio always available here at bargain prices.

Ica, Goerz and Graflex Cameras
Carl Zeiss Lenses

Soft Focus and Portrait Lenses
Enlarging Outfits

Supplies for Bromoil and Other Processes

ABE COHEN'S EXCHANGE
113 PARK ROW, NEW YORK

Important RHODIA radio announcement. Good prints are only obtained from good negatives, and both require developers of unqualified purity.

RHODOL (Metol)
HYDROQUINONE

Manufactured by

RHODIA CHEMICAL COMPANY
21 Spruce St. (Cor. William St.), New York City

READY TO RECEIVE ANY POST CARD PICTURE. 6″x8″ SIZE OF MEDALLION.

MAKE IT YOURSELF MEDALLIONS

THE VERY LATEST PHOTO NOVELTY

Any Photographer anywhere in the world can now make his own medallions without one penny invested in machinery.

"OBLONG" AS IT IS WITH CABINET PICTURE INSERTED. 6″x8″ SIZE OF MEDALLION.

We furnish medallions in dozens of beautiful designs, complete in every way except the photograph which you yourself insert from the back.

Six samples and quantity prices mailed post paid for three dollars to Countries with which U. S. has parcel post relations.

We are ORIGINATORS and World's largest manufacturers of Photo Medallions, Photo Buttons, Button Machines, Medallion Machines, Button and Medallion Parts, Etc.

CRUVER MFG. CO.

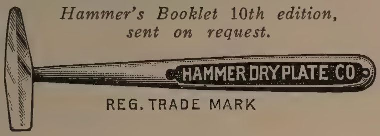
2456 W. Jackson Blvd. CHICAGO, ILLINOIS, U. S. A.

"Made on Honor and Sold on Merit"

HAMMER PLATES

excel because of rigid inspection, skilled workmanship and ideal factory conditions. They are coated on clear, transparent glass.

Hammer's Booklet 10th edition, sent on request.



HAMMER DRY PLATE COMPANY

Ohio Avenue and Miami Street, St. Louis, Mo.
N. Y. Depot, 159 W. 22nd Street, New York City

ROEHRIG'S

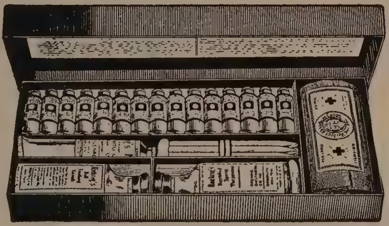
Transparent Oil Photo Colors

GIVE THE DELICATE TINTS OF NATURE'S OWN COLORS

A superior pigment whose permanency is guaranteed against the action of time and sun is the assurance that your work will be preserved.

The professional and amateur alike know their skill is unhampered by difficulties with the medium when using Roehrig's that will not fade or rub off unless alterations are needed, in which case changes are easily made without harming the print.

At all dealers in a set or by the tube



Under a decree of the New York Supreme Court *dated May 21, 1925, the ROEHRIG-BIELENBERG CO., Inc., has been decreed to be the originator and sole owner of the combination box of oil photo colors known as "Complete Outfit" and in the same action the defendant's "Complete Outfit" was found to be an imitation of ROEHRIG-BIELENBERG CO., Inc. "Complete Outfit" and had been prepared and offered for sale by him with intent to deceive and defraud the public and the buyers and consumers thereof.*

For further information address Dept. D

ROEHRIG-BIELENBERG CO., INC.

39 Henry Street **Brooklyn, New York**

CAMERAS—KODAKS—LENSES and SUPPLIES

(new or used)

at record-breaking prices. Write for copies of our

Latest Catalog and Bargain Book

and convince yourself. Hundreds of "good as new" bargains listed in our Bargain Book. Right now is the best time to pick up a Bargain in the photographic line. We buy—sell and trade. A trial of 10 days is granted on every item we sell. If at the end of that time you are not satisfied with your purchase you may return same for something else, or we will refund your money.

CENTRAL CAMERA CO.

112 So. Wabash Ave., Dept. AA-3 Chicago, Ill.

SYSTEMS
and
ORGANIZATION

BERRY & CALHOUN

BUSINESS BUILDERS
200 West 72nd Street
Suite 64
NEW YORK CITY

COST
ACCOUNTING

IF your business or studio is, and has been, at a standstill, there are ways and means for the betterment in convincing even the most skeptical. Fact, rather than theory, can invariably uncover the cause by getting down to its very roots. The man drowning grasps a straw as his only salvation, while the second guesser offers a remedy to keep his head above water hours after the funeral. How often have you secretly envied a successful competitor? The logical solution is to employ reliable agents to show the way to better business.

Information on request.
Write to Dept. C.

ARE YOU REALLY INTERESTED IN PHOTOGRAPHY?

IF you are a beginner, amateur or professional; if you are interested in Amateur Kinematography, Stereo-Photography and everything which pertains to making good pictures, then you will like to read

PHOTO-ERA MAGAZINE

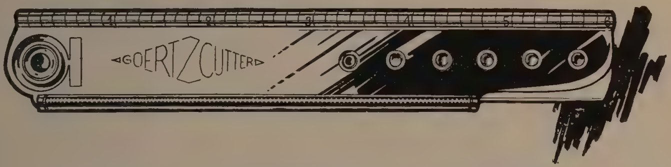
The American Journal of Photography

Established 1898

This magazine is different editorially and typographically. It aims to be human and friendly, with special interest in the beginner and his success. Each issue has practical and inspirational illustrated articles and editorials. There are departments in this magazine which will not be found elsewhere. These have contributed to build up the strong, friendly reader-interest which the magazine enjoys today. Upon receipt of ten cents in stamps, we shall be very glad to mail a specimen copy to any address.

Subcription-price, $2.50 *per year. Canadian,* $2.85. *Foreign,* $3.25.

PHOTO-ERA MAGAZINE
WOLFEBORO, NEW HAMPSHIRE, U. S. A.



The GOERTZ-CUTTER

"The sharpest knife in the world" is ideal for many kinds of photographic work where a cutting, slicing or scraping edge is needed. Briefly, it's a well-made, compact handle for razor blades of the Gillette type, with an unlimited number of uses.

Brushed Brass, 25 cents (Leatherette Sheath, 10 cents). Black Nickel Gold Plated Slides, 50 cents. Polished Nickel Finish, 75 cents. Polished Gold Plated (engine turned design), one dollar. Postage 5c. extra.

AUGUST GOERTZ & CO., INC.
Manufacturers of Metal Specialties
270-286 Morris Ave. Newark, N. J.

Photograms of the Year 1926

EDITED BY F. J. MORTIMER

The International Annual of Pictorial Photography

This volume contains numerous fine reproductions of the

BEST PICTURES OF THE YEAR

from the London Salon, the exhibition of the Royal Photographic Society, the principal American and foreign shows of 1926 and selected examples from American, British, French, Italian, Belgian, Canadian, Australasian, Scandinavian, Japanese, Russian, Spanish, Dutch, Czecho-Slovak, Swiss and Indian workers.

Also interesting reports of

The Progress of Pictorial Photography Here and Abroad

Written by prominent pictorialists of different countries forming

A complete record of the best pictorial photography of the year and a treasury of inspiration to all who follow picture making with the camera.

8½ x 11 inches. Strong Paper Covers $2.50 Postfree
Clothbound $3.50 Postfree

The book will be published in London in December, and will be ready for distribution in the United States early in January. The importation order is already practically covered by advance orders from dealers, and, by past precedent, those who do not assure themselves of a copy by placing an advance order, may find it difficult to secure one.

American Agents:

AMERICAN PHOTOGRAPHIC PUBLISHING CO.
428 Newbury Street Boston 17, Mass.

Photographic Amusements

By Walter E. Woodbury

This interesting book, describing many novel, ingenious, amusing and ludicrous effects obtainable with the camera, had been out of print for several years, though previous to that time it had passed through many editions and was one of the most popular photographic books ever sold. We have reprinted the book with the original text and a number of new sections. We can recommend it to all who desire to utilize their ingenuity in producing interesting pictures out of the beaten track. The contents are as follows:

Introduction—The Mirror and the Camera—The Photo-anamorphosis—Statuette Portraits—Magic Photographs—Spirit Photography—Photography for Household Decoration—Leaf Prints—To Make a Pen and Ink Sketch from a Photograph—Photographs on Silk—Photographing a Catastrophe—Photographs on Various Fabrics—Silhouettes—How to Make a Photograph Inside a Bottle—Photographing the Invisible—Photographs in Any Color—The Disappearing Photograph—Freak Pictures With a Black Background—How to Copy Drawings—Sympathetic Photographs—Dry Plates That Will Develop With Water—Caricature Photographs—Photographing Seaweeds—Stamp Portraits—Luminous Photographs—Floral Photography — Distorted Images—Photographs Without Light—Electric Photographs—Magic Vignettes—A Simple Method of Enlarging—Moonlight Effects—Photographing Snow and Ice Crystals—Photographing Ink Crystals—Pinhole Photography—Freak Pictures by Successive Exposures—Wide-Angle Studies—Conical Portraits—Making Direct Positives in the Camera—Instantaneous Photography — Artificial Mirages by Photography—Photo-Chromoscope—Composite Photography—Telephoto Pictures—Lightning Photographs—Photographing Fireworks—Doubles—Double Exposures—Comical Portraits—The Two-Headed Man—Duplicators and Triplicators—Pictures with Eyes Which Open and Close—Photographic Bookplates—Landscapes and Groups on the Dining-room Table—Night Photography—Photographs on Apples and Eggs.

128 pages, 114 illustrations, size 6⅛ x 9¼. Bound in red cloth. Price $1.50.

American Photographic Publishing Co.
428 Newbury St., Boston 17, Mass.

Voigtlander Heliar Lenses

Unrivaled for Studio Use

Because of their universally recognized qualities, Heliar lenses are the choice of the most expert portrait artists and studio photographers. They absolutely eliminate spherical and chromatic aberrations, flare, coma, and other optical defects usually found in lenses not properly corrected.

At Your Dealers

MOTION PICTURE APPARATUS Co. INC.

110 W. 32nd Street, New York

United States Agents

The Artistic Merit of Your Work Will Increase When You Use

TOWLES' PORTRAIT LIGHTINGS

Bound in cloth, printed on fine old ivory coated paper, size, 8x11 inches.

$5.00 POST PAID

FOR this book is the work of a master, in a series of diagrams (37) accompanied by short, vivid descriptions and full-page illustrations, making up 44 easy lessons so well planned and instructive that it requires the minimum of your attention to grasp them—your work can't help improve.

You get the fundamentals and refinements of portrait lightings in this wonderful new book. Order your copy TODAY from your dealer or

FRANK V. CHAMBERS, Publisher
153 N. Seventh Street Philadelphia, Pa., U. S. A.

HENRY GREENWOOD CO., 24 Wellington St., Strand, LONDON, ENGLAND

Make Your Prints in Colors (40 Shades)

An Explanatory Diagram Showing the Various Stages in the Production of

AUTOTYPE CARBON PHOTOGRAPHS

The Production of an Autotype Carbon Photograph

HOW IT IS DONE

A

The Coated Surface of Exposed Carbon Tissue (Pigmented Gelatine).

B

Single Transfer Paper.

C

Soak A and B in cold water, bring coated surfaces together in contact and squeegee.

D

Place the adherent tissue and transfer paper between blotting boards for a few minutes. Next immerse in warm water, until the colored gelatine begins to ooze out at the edges.

E

Strip off the tissue backing paper and throw it away.

F

A dark mass of colored gelatine is left on the transfer paper. This remains in the warm water and the gelatine surface is sprinkled over until the picture gradually makes its appearance.

G and H

Continue until completed.

I

The picture is now placed in an alum bath (five per cent) to harden the film and discharge the bichromate sensitizing salt. A rinse in cold water completes the operation

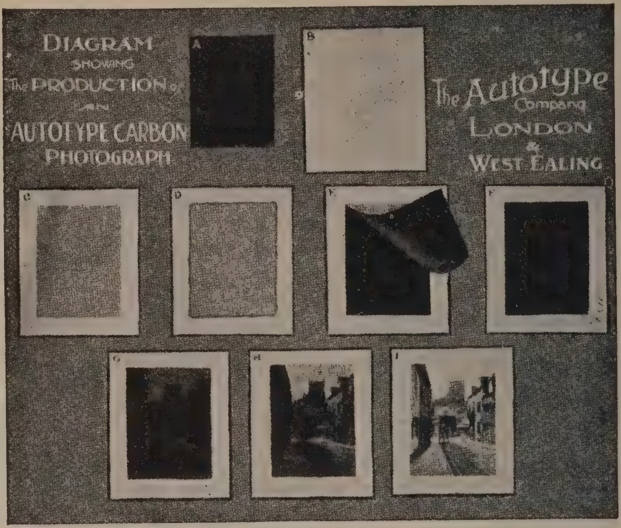


DIAGRAM SHOWING THE PRODUCTION OF AN AUTOTYPE CARBON PHOTOGRAPH
The Autotype Company LONDON & WEST EALING
A
B
C
D
E
F
G
H
I

TRIAL SETS OF CARBON PRINTING MATERIALS

In order to combat the erroneous notion, somewhat prevalent amongst Amateur Photographers, that a trial of the Carbon Process necessarily entails the expenditure of a considerable sum on costly apparatus, we have decided to introduce trial sets of the absolutely essential materials.

PRICES OF TRIAL SETS

No. 1 Outfit for 5 x 7	$3.00	Postpaid
No. 2 Outfit Complete for 5 x 7	8.00	"
No. 4 Outfit Complete for 8 x 10	11.50	"

American Agents, GEORGE MURPHY, Inc., 57 East 9th St., New York

Send for Free Descriptive Booklet

George Murphy, Inc.
Photographic Materials

Headquarters for:

Established 1878

CELLOFIX (SELF TONING PAPER)

A new printing out self toning paper on imported stock. Rich tones—wonderful selection of colors and surfaces. Tones in salt and hypo. Permanent results. Made in the following grades: *White Matt Rough, Cream Matt Rough, White Matt, White Glossy, Cream Matt Smooth, Cream Fabric, Matt Art Tinted Orange, Cream, Blue, Green, Assorted (4 colors).*

Sizes	Dozen	½ Gro.	Gro.
2¼ x 3¼	$ .15		$1.40
2½ x 4¼	.20		1.70
3¼ x 4¼	.25		2.25
4 x 5	.30		3.00
3¼ x 5½	.30		3.00
4 x 6	.40		3.50
5 x 7	.55	$2.80	5.50
8 x 10	1.25	5.90	11.25

Postals....................per doz. .30
" .... " 100 2.25
" .... " 500 10.00

Elephant Proof Paper

HEAVY WEIGHT

Glossy and Semi-Matte

This is the best proof paper we have ever offered. Made on heavy weight (double weight) imported pure white stock it gives rich attractive proofs. The kind of a proof to bring you in a big order. Send to us for sample sheet, and compare with what you are using.

Prices Net Cash

Cabinet	$1.25
4x6	1.35
5x7	2.10
6½x8½	3.40
8x10	4.80
11x14	9.00

OUR LENS DEPT.

Before you Buy, Sell or EXCHANGE your Lens—write

Dunn—The Lens Man at Murphy's

A good selection of high grade second hand Lenses always on hand. We can quote you on Portrait, Commercial, Process and Soft Focus Lenses.

Get our quotations on complete outfits—and save money.

Send us your orders. Our Prices and service are right.
We invite correspondence on anything photographic.

Large mail order department

Send for free copy of SNAP SHOTS
(Our monthly magazine.)

Mammoth Catalogue of Photographic Supplies

GEORGE MURPHY, INC.

57 East Ninth Street New York City

Developing—Printing—Copying—Enlarging

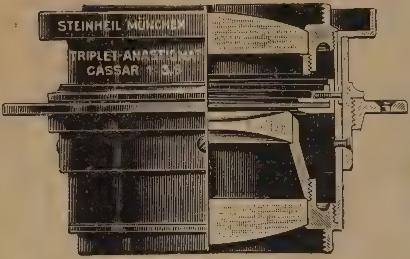
Everything Photographic

STEINHEIL LENSES

are the result of 75 YEARS research by the world famous scientists

C. A. Steinheil Söhne

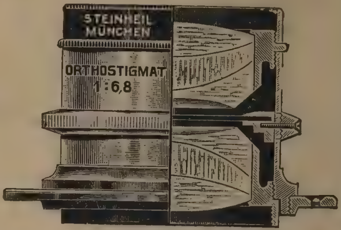
A Test Will Prove



Cassar F:3.5

(Triple Anastigmat)

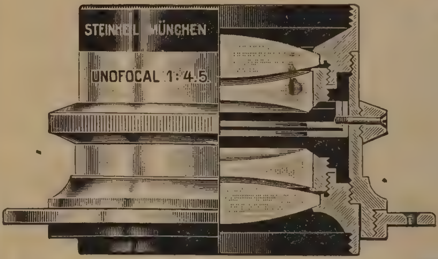
Unexcelled for even sharpness and depth of focus.



Orthostigmat F:6.8

(Convertible)

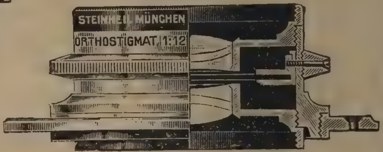
Microscopic sharpness for commercial work.



Unofocal F:4.5

(Double Anastigmat)

Ideal for general purposes, convertible.



Orthostigmat F:12

Wide angle over 100°.

Unusual covering power, extreme sharpness.

WRITE FOR NEW CATALOG

B. HOPFEN & CO.

Sole U. S. Agents

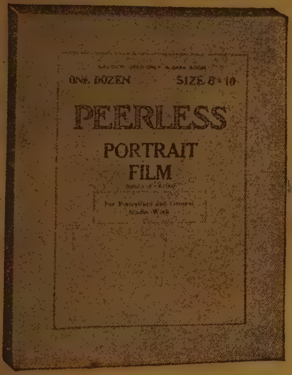
239—4th Ave., New York

PEERLESS FILM

(Made in U. S. A.)

ORTHOCHROMATIC - - - - NON HALATION - - - - NON ABRASIVE

The Quality Film for
Portrait
Process and Commercial Use



Regular and Safety Base

This new film has several important features not found in any other make. It is non-abrasive, which means with handling the usual scratches are not produced. One of the characteristics of the Peerless emulsion is that it has a tooth so that you can readily retouch on either the back or film side without the use of retouching solution. It is coated on a clear white stock entirely free from spots.

Due to the fact that these films are non-abrasive they are not backed with the usual interleafing of black paper, thereby lengthening the life of the film, as the paper has a tendency to cause deterioration. You should not fail to give this film a thorough trial. You want the best. You will find it in the PEERLESS brand.

Peerless Portrait Film

PEERLESS PORTRAIT FILM by a new process has a finished surface that can be retouched with great ease on both front and back. This film possesses wide latitude, soft detail and dependable speed. The latitude and brilliancy of the high lights have been favorably commented on by many critical professionals.

Peerless Commercial Film

PEERLESS COMMERCIAL FILM is suited for general photography, sufficiently fast for rapid work, with snap and contrast that insure good negatives. The freedom from scratches and abrasion-smudge is particularly noticeable in black background pictures.

Peerless Commercial Ortho Film

Same as Peerless Commercial Film. In addition being Orthochromatic.

Peerless Process Film

PEERLESS PROCESS FILM is especially adapted for exacting copy work—possessing rich blacks, sparkling whites and fine grain. This film being entirely free from fine scratches and abrasion-smudge can often be used without the customary "cutting."

Peerless Photomicro Film

This film has been carefully worked out for the exacting demands of photo-micrographic work. We have prepared a booklet on the subject which should prove helpful to anyone doing photo-micrography. These booklets will be supplied on request.

Send for Price List.

Manufactured by

AMERICAN PHOTO PRODUCTS CO.
VERONA, NEW JERSEY

New York Agents
GEORGE MURPHY, Inc., 57 East 9th St., New York City

MADE especially for the amateur, one of its four grades meets every negative need—exactly. Whether the negative is contrasty, average, flat or extremely flat, Velox fits for the results you want.

Every Velox print has the name lightly tinted on the back.

EASTMAN KODAK COMPANY
ROCHESTER, N. Y., *The Kodak City*

98337

GETTY CENTER LIBRARY
3 3125 00615 3429